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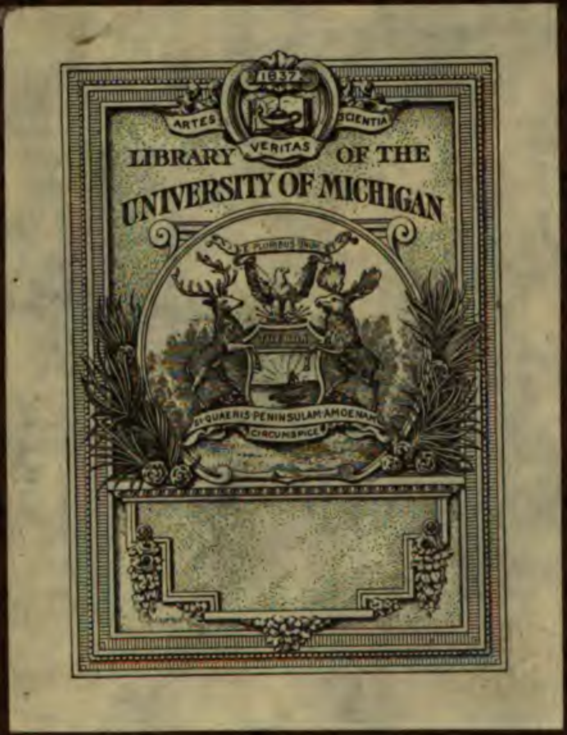

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TWELFTH ANNUAL REPORT

OF THE

BOARD OF HEALTH

OF THE

STATE OF NEW JERSEY,

AND REPORT OF THE

BUREAU OF VITAL STATISTICS.

1888.

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TRENTON, N. J.:
THE JOHN L. MURPHY PUBLISHING CO.
1889.

THE STATE BOARD OF HEALTH.

◆

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Hon. John P. Stockton, Attorney-General,
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196523

REPORT OF THE SECRETARY OF THE BOARD.

To His Excellency Robert S. Green:

GOVERNOR—In presenting to your Excellency, on behalf of the State Board of Health of New Jersey, its twelfth report, I also have the honor to present the tenth report of Vital Statistics. So soon as the State Board of Health was established, it became apparent that a new law was needed to secure a more perfect return of the marriages, births and deaths occurring in the State. These form the account which the State keeps of the movements of its population—that material which takes the lead in all its vital resources. This record forms, in many respects, the basis of health administration and by facts and comparisons indicates those preventable agencies which are at work to destroy life or to sap the vigor of the people. Until the last year this bureau retained its connection with the Department of State. At the instance of the honorable Secretary of State and by the action of the Legislature, the bureau has been transferred so as to become fully identified with the health department. This much increases the work of the office, although no additional appropriation was made. This closer connection is manifestly proper, and will enable us still more vigorously and effectively to study the great health problems which have so much to do with the industries and happiness of our people.

The details as to the general health in different parts of the State will be found in the statistics of this last report. There will also be found decennial tables giving important facts as to vital statistics for these last ten years. Thus, by the large number of people represented and the number of years, the possibility of error from small numbers is eliminated, and still more significant facts brought out. The year has been one with a fair degree of health. With our rapid increase of population, especially in our cities, it is to be remembered that the prevention of an increase of the death-rate is something of an achievement. The year has been marked by no special epidemic or endemic, except that in a few instances diphtheria has proved a serious endemic in some localities. Even in these cases the people have seen, when in part too late, how the closing of schools, the prohibition of public funerals and strict isolation, cleanliness and disinfection would have saved many a life.

LOCAL BOARDS OF HEALTH.

The prominent feature of the year has been the more complete organization of Local Boards of Health. While these may act without published ordinances, yet a published code greatly facilitates their work. A large number, both of the city and township Boards, have adopted new sets of ordinances or revised old ones. The result has been a more thorough enforcement. It has also come to be recognized that a Sanitary Inspector is a necessity in all cities, towns and villages, and where these have been appointed some excellent work has been done.

There is much need of some method of training Inspectors in their duties, in teaching them how to prevent nuisances as well as to abate them, and also that Local Boards require a daily or weekly return and record of the work done or needing to be done. One cannot study the systematized methods of New York city, for instance, without being struck with the invaluable benefit of that exactness of method which is applied in all well-conducted departments of public business. New York, for instance, is furnished with over twenty constant Inspectors, besides some special ones in summer. Complaints received are at once mailed to the Inspector of the district to which they relate. At the end of the week each Inspector sends to the central office a detailed statement of his week's work; from it he makes up a tabulated summary, which is submitted to the Sanitary Superintendent. Besides the prompt action of each Inspector in particular cases, further orders are then given as to the dealing with particular nuisances. In Asbury Park, Newark and Paterson this plan is somewhat carried out, and to an imperfect degree in many other cities and localities.

While there is much in the local health administration of the State for which we have reason to be grateful, yet when we compare ourselves with the most advanced cities, and especially those of England, we have reason to reach forth toward much greater perfection both in administration and the appliances for administration. In addition to house-to-house inspection and all the details which belong to a perfect system of sanitary inspection, nearly every city of over 20,000 inhabitants needs (*a*) a place to which cases of contagious disease can be taken for isolation and so as to give opportunity to fumigate and cleanse the locality in which it occurred; (*b*) a disinfecting apparatus (see XI., 1886, Report of A. P. H. Association), to properly disinfect all clothing exposed to contagion; (*c*) a garbage destructor, in which can be consumed decayable substances; (*d*) facilities for bathing for all classes, not to mention many minor needs. All these cannot be secured at once, but every intelligent Health Officer has such aids in view. No form of tax is so well expended as that which protects the public health, and it is believed that public opinion will more and more support such liberal expenditures in defense of the common health as are consistent with a true economy.

While the educational work of the State Board and Local Boards will never fully cease, we are feeling that the great work now to be pressed upon localities is that of more efficient administration.

The State reports will not need to be so full, since the sources of sanitary information have multiplied a hundred-fold since our work began. In these reports we shall seek more fully to devote ourselves to the explanation and elucidation of practical methods of local prevention of nuisance and enforcement of law. This State has now given abundant authority to Local Boards, and in the act of last winter, giving them, in all cities and towns, power over the construction and plumbing of buildings, has added almost the only indispensable requisite to thorough sanitary control.

In order more fully to secure this thorough local administration, the State Board has given special attention the last year to personal instruction of localities. General Inspectors have been employed and the Boards have more fully looked to us for reliable opinion and advice. We thus have been able, as never before, to put ourselves in close connection, with the most marked sanitary advantage.

It would be well if the appropriation permitted us to extend the system, but even with what we have, very much is being done.

In further details to be found in the Secretary's report and in the various articles and communications from Local Boards appended thereto, we believe your Excellency, the Legislature and our citizens generally will find much valuable information.

PUBLIC HEALTH.

We shall not attempt to argue the question whether health is so great a public concern as to require the attention and oversight of the State. This has already been determined by the precedent established by all civilized countries, and by the growing attention everywhere given thereto. The highest object of the State is the welfare of the citizen. This does not mean that the State must concern itself with everything that relates to his welfare, since some things must necessarily be left to private and personal concern. But it does mean that in those respects in which political economy and the thrift of the State are concerned, in which private conditions largely involve individual interests, and in those matters which, as being general, must be regulated by law, the citizen must be governed so as not to imperil the life and health of his neighbor. It is in this spirit that ancient law and civilization dealt with epidemics, established quarantines, and made nuisances a misdemeanor at common law. It is a higher and a better regulation, when, within proper domain, it attempts to prevent those evils which imperil the life and health of communities by those preventive and regulative measures which diminish both death-rate and sickness-rate, and so materially add to the population, to the working capital and the vital resources of a nation.

As a consequence, the organic law of this necessity is no longer discussed. The only question is, what regulation shall be exercised by the city or the rural precinct, independent of its neighbor, or what other regulation or oversight shall be sought or exercised by the State or the nation.

It is in accord with the genius of our government to allow home rule of these matters to a large extent and so far as is consistent with the integrity of the adjacent districts. A city, for instance, can properly determine what nuisances shall not be allowed within its borders. But if the result is to expel, to a smaller town outside of its limits, a nuisance none the less serious to the citizens of that town, it, although a more rural district, must somehow have its rights protected. In order that these various divisions of a State may be protected and yet not infringe on each other's right, some State regulation is required. The very success of the system demands a harmony in adjustment such as can only be had by so much of general or State law as shall reach this object.

A second important function of a State is to impart such information as to so vital an interest as the public health, as shall enable the citizen to avail himself of those advantages of protection which arise from knowledge of the evils to which he is or may be subjected, and the best mode of avoidance or riddance. It is on this principle that education is made so largely available at the cost of the whole State and not left to be a city or neighborhood measure; that the people generally are informed as to the vital resources which may be made available, and even the newspaper is dealt more liberally with on the ground that it is a great educator of the masses, and so conserves the welfare of the State. While there are proper limitations of the degree to which such a function should be exercised, yet when we know that life and health are the most vital resources of a State, it behooves that we at least conserve it with a liberality equal to that which is extended in promoting our other resources or in increasing the intelligence of the people; therefore, next to education, there is no social interest so thoroughly entitled to the protection and securement which legislation can afford.

A third most important principle is that the value of much of the knowledge to be derived as to the welfare of the people depends upon such extent, reliability and uniformity of information as shall admit of co-study and make the various facts comparable with each other. A city or district may gather correct and important information, but the area or the aggregate of facts collected is not enough to enable us to eliminate errors or arrive at principles. We need also the information which can only be secured by comparing various localities with each other. In order to do this there must be a system such as can only be made available when all the facts can crystallize around a common center. In order that we may understand the significance of local facts, a mapping out of the whole is needed.

These are but a few of many reasons that have led this State, like other States, and the United States, like other governments, to recognize the necessity of State Boards of Health and of State Bureaus of Vital Statistics, which shall consider the relations and needs of each city and precinct so far as they concern adjacent areas, which shall so oversee and adjust as to make local conditions and facts comparable with each other in such wise as to enable us to know the vital condition of all the State, and which shall impart such information as essentially concerns the common thrift and welfare in this regard.

WHAT IS HYGIENE?

The science and art of preservation are, to-day, in a wholly different position from that which they occupied even but a half century ago. The necessities of humanity, and the ills apparent, even before the final article of death, could not but excite some of mankind to an effort to relieve disease and to postpone the significant and affecting change from life to deadness. Those who most feelingly and forcibly made this effort, could not but become observers of the phenomena of sickness as compared with the condition of wellness, and so, from time to time, experience was gained. Such experience of observing minds, and such results of mere empirical trial as manifestly relieved human pain or prolonged human life, early gave rise to a class of men upon whom the title of physician was bestowed.

A most significant title it was and is—for it is the first compliment to, and recognition of man as a student of nature—as the word was derived from the idea of a studying of nature and a bringing forth of truth; it also denoted knowledge as well as observation. Even the term "medicine," as derived through another language, has similar philological relation, for it denotes "knowledge by measurement."

It was a later and a degraded conception that made physic and medicine, names for the drugs and potations administered, and thus, in the nauseous dose of the compounder, forgot or lost the true and noble significance of the word.

Hygiene, as a name, has a similar nobility of origin. It so far meant that *wisdom* which knows of nature, in order to preserve or cure mankind, that the dispute of mythology as to it, was, whether it was one of the names of Minerva, the Goddess of Wisdom, or a name given to one of her dearest daughters. At any rate, her statue preserved the ancient emblem of wisdom in the one hand, and in the other a cup, out of which the serpent of wisdom sometimes drank. In the early ages, and through all the history of the art of healing, it is apparent that our guild had an idea of nature as the great healer, and of conformity to nature as the great means of preventing human ailments. Ever and anon, the conception is put into most definite forms, as in many of the aphorisms of Hippocrates.

Yet the conceivable was very far from being the actual or the attainable. Until science and art had made marvelous progress in those sciences whose facts and relations have to do with a full knowledge of the structure and physiology of the human framework and organs on the one hand, and with the forces contributing or essential to the sustentation of human life on the other, it was impossible that hygiene should be anything more than a charming idea, a goddess resting in quiet sleep until the day-dawn was at hand for activity as a result of insight.

What could we know of blood as a vital fluid before Harvey lived, and while arteries were supposed to be the conduits for air?

How could we talk of air before Priestley, at the close of the last century, cleared up the enigma of its action?

How could we know of foods and liquids, as adapted to mankind in their various preparations, until we could derive some indications from chemistry of their constituency and of means for detecting impurities?

It is because there was so much of this preliminary and collateral inquiry to be made that hygiene, in its modern sense, had to abide its time. It is because of this that it is only within the last half century that we could, with any propriety, use the expression "sanitary science." If it is true, as Tyndall not ungenerously says of medicine, that "previous to the discoveries of recent times, medicine was not a science, but a collection of empirical rules," it is still far truer of the science and art of hygiene. But at length light has dawned, the dayspring from on high, from beneath, from around, from within has visited us. Although there is still a vastness like the vastness of the sea to be explored, yet the light is upon the waters and we no longer grope without a pilot.

With this light, as reflected upon us, the following is a brief outline of the line of direction in which our inquiry and our practice is to be:

We are first to study methods for the prevention of disease; second, methods for the limitation of disease. This study presupposes either a thorough knowledge of or an inquiry into the nature, constitution and necessities of the human being, also a thorough inquiry into or knowledge of that part of nature on which the life and vigor of human beings are dependent—sometimes called the *environment*.

Also, a thorough inquiry into and knowledge of departures which have occurred in the case of either, in order to study modes of return and re-adjustment, or where this is not possible, the best mode of conforming to the changed conditions.

This, in its turn, involves a study (*a*) of the causes of health; (*b*) of the causes of disease.

Having found the cause of health, how shall we promote it?

Having found the cause of disease, how shall we intercept and prevent it?

Having, in all various possible ways and in any or all of these particulars, acquired some knowledge, we then consider and adopt those administrative methods which are necessary to secure the desired result.

While it is not necessary to dwell on each of these sanitary axioms in detail, it is worthy of note that some of them are quite frequently overlooked. Besides the study of methods for the prevention of disease, there is a study of methods of limitation, quite apart from that treatment of disease by remedies which is conceived to be the especial vocation of the physician.

While the inquiry into the nature, constitution and necessities of the human being as found by the study of anatomy, physiology and experience is recognized, it is not appreciated that an equally close study of that part of nature to which he is co-ordinate is equally essential, as well as the needful adaptation of the one to the other.

When, again, we come to deal with the human being as we so often find him, and with his environment as we often find it, we soon see the impossibility of instantaneous return to normal conditions, and so are forced to study that practical sanitation which in part accepts things as we find them, and realizes a new sphere of activity in the line of adjustment and in the limitation of present embarrassments.

The study of the causes of health also takes a wider range than the mere study of anatomy and physiology, or even of surroundings, for it gives consideration to heredity, to mental force, pluck, nerve vitality, &c., and recognizes that health itself is often to be studied, with all the facts of experience, and with all the information to be derived from disease or its progress toward recovery. So, in either aspect, the study of the causes of disease has a range such as has made etiology in general, and epidemiology in particular, an inquiry so broad that its different classes of facts are scanned as are the different constellations in the heavens. Because the study of causes is so fundamental, it has very properly taken the lead in what may be called the science of hygiene as distinct from the art. Etiology, or the science of causes, is thus one of the very foundations in this great realm of study. So it has been accepted, and the painstaking workers and the inspiring results have never been excelled in the same period of time in any of the experimental researches of modern times.

WATER-SUPPLIES.

In previous reports we have very fully considered the subject of water-supply. In our last report the article on the Passaic water-supply embodies many facts which are worthy of close study in their application to other public supplies in this State. Investigation into the water-supply of the State, carried on during the past year, while revealing on the one hand some excellent and efficient plans and satisfactory results, also shows that sources of supply are too often chosen without skilled foresight; that companies are formed without due protection of the constituency which they are to supply, and that too frequently a majority of the population do not avail themselves of the public source. Greater care is being exercised as to new water-works, so that some of the more recent have been well planned and executed by competent hydraulic engineers. Our State, by the topographical surveys under the direction of our State Geologist, by the report of the State Water Commissioners and by the various facts contained in the reports of the State Board of Health, have left communities without excuse if they fail to secure a pure and abundant supply of drinking-water.

SUPPLY FROM DOMESTIC WELLS.

Notwithstanding the best provisions that can be made by public water-supplies, a large portion of our population will continue to be dependent upon the family well of each particular household. For this reason it cannot be too forcibly impressed that the home well must be kept in a state of purity. It is not enough that a good source of supply has been reached in the ground beneath, or that the well for a long time has furnished good water. All wells less than forty feet in depth represent the drainage of the adjacent soil. If, by the erection of outbuildings, stables, or the introduction of an excessive amount of organic matter into the upper ground within a radius of 100 feet from the well, there has been contamination of the soil, there is always danger that percolation will not be sufficient to secure the purity of the water that through this upper stratum finds its way to the well. Besides the accumulations on the stone or brick, the decay of wooden curbs used in the steining, the intrusion of roots into the sides and bottom of the well and various accidents by which small animals or other decayable substances get into the well from above, often cause pollution of the water. The well should always be cemented to within two or three feet of the top, and the cover should be impermeable. The rinsing of vessels or the throwing of any slops about the well should be regarded as against the law of life as it is against the law of cleanliness. Health Inspectors should never forget to inquire as to the well and make personal examination of it. Whenever, for any reason, the water seems bad and no other supply is at hand, let it be boiled before drinking. The use for a single day or week may cause a fever or dysentery, or in some minor way disorder the system. Young children are especially susceptible to these influences. Guard your home well as you would guard the dearest interests of your family, for it is now well proven that impure well-water is the cause of many a prolonged or fatal sickness or of chronic ailments.

THE EXAMINATION OF POTABLE WATERS.

The progress of investigation into the causes of diseases is constantly emphasizing the importance of securing pure water-supplies. This does not mean that multitudes do not drink impure waters for long periods of time without any recorded or declared effect. It is indeed wonderful how many trespasses may be made upon the laws of a perfect and unembarrassed vitality without any recorded or immediate effect. There is a law of resistance and restoration as well as a standard of excellence. All that can be said of many departures from the standard is that there is wastage of force without any record of such disturbance of function or change of organ as constitutes disease. If this were always the case, then any inquiry and search after the exact standard of purity would be pure science without apparent utility. But experience has shown us that deviations from certain standards are hazardous, because in certain states of weather or other surroundings, or in certain ages and constitutions, there may be and are serious results. Sometimes these are of a general character, as where some slight disturbance of the digestive act takes place, and there is slight fever or diarrhœa or other functional disturbance. In other cases there is some specific form of disease, as typhoid fever or epidemic dysentery. As we cannot know all the persons or all the circumstances which invite such manifestations, our only safety is in seeking to know fully what the standard of a pure water-supply is, within what limits there may be harmless variations, and how departures from the proper condition may be detected. For the present we leave out the evidence to be derived from the general practitioner. We also leave for another time the discussion of the significance of chemical tests and determinations. We do not willingly throw suspicion on these, and could give many reasons why the various tests made by chemists come in as parts in making up the evidence. We can give equally good reasons why chemical evidence alone is often pushed to an extreme of conclusions not justified.

Dr. R. Angus Smith, the Inspector for the Examination of Waters under the Rivers Pollution Act of England, 1884, in his last communication says: "Having shown some of my earlier opinions on the analysis of water and the necessity of searching for organisms found therein, it is clear that I have long been conscious of the imperfect nature of chemical analysis as applied to the question." Yet he greatly valued these as a part of the testimony to be secured in summing up the evidence. It is not surprising that when a knowledge of the relation of micro-organisms to some diseases came to be recognized, that the chemists themselves became inquisitive in this new department. Angus Smith was among the pioneers in this field and in insisting upon the advisability of bringing the methods of bacteriologists to bear upon examinations of water. But he was far wiser than some of his imitators. He at once recognized that bacteriology was as distinct from chemistry as is microscopy or biology. He did not fall into the singular error of giving a decided opinion of the quality of a drinking-water based on the number of microphytes he could count. While believing it important to measure the amount of organic life existing in water, he is careful to indicate that our knowledge cannot be interpreted until we come to know the forms or quality of the microphytes, and even their state of activity. "To say," says he, "that a certain class of microbe is present, is not to have a very definite idea." Then again, "these bacteria found in the waters which have been examined are not germs of disease, necessarily; we are drinking them constantly. There may be conditions in which they cannot be called innocent." He therefore concludes that the time has come when waters must be examined from a point of view of the organisms more than from any other point, but chemists must be very careful of the conclusions to be drawn, very careful also not themselves to be afraid of the existence of organisms, because it is exceedingly probable that there are organisms of a wholesome as well as of an unwholesome character. This probability is now a certainty.

Our desire now is to inquire what progress has been made since the utterances of 1884, in separating the different forms of microphytes, in determining their significance, or, in other words, how far from these we can determine the fitness of water for drinking purposes. Burdon-Sanderson and others have shown that most water contains some bacteria. The experiments of Warden and Frankland, and the several cautions given by Klein, show the many sources of error as to source and numbers, and even when the number is found, how little is the significance without many other facts. Dr. Meade-Bolton, of the hygienic institution at Gottingen, who has devoted much time to these examinations, finds that microbes are found in every kind of water. He concludes that the chemical condition of the water possesses no other importance than that of raising suspicion of the presence of pathogenic bacteria. The determination of the kind of bacterium is of higher importance in bacteriological analysis than the enumeration of the total quantity of bacteria contained in the water under examination. When we consider that in no drinking-waters hitherto analyzed, have pathogenic bacteria been found except where they had been put by the experimenter, we see that we as yet have from this source no guide as to purity. For two years or more, Dr. Percy Frankland has made systematic bacteriological examinations of the Metropolitan water-supply of London, and has become a leading authority on the value of this kind of examination. He says "the more sanguine investigators were doubtless of opinion that these researches into the nature of the micro-organisms present in natural waters, would readily lead to the discovery of forms possessing pathogenic properties in some waters, and that upon the absence or presence of such disease-producing organisms, it would be possible to form an opinion as to the fitness or unfitness of water for dietetic purposes. There are many persons who still regard such a discovery as the ultimate scope of the bacteriological examination of water; but a little reflection will at once show how small is the interest or value attaching to such an investigation." But he does attach great value to the demonstration of the passage of any living organism, pathogenic or harmless, from a center of contamination into a source of drinking-water. He thus believes the identification of various forms common to both, will be valuable in determining the source of contamination. Also that we shall be able to test processes of filtering by the results they show in diminishing the number, either by their detention, or by removing the material on which they thrive. Even these views are opposed by Bischof, as we do not yet know the value of the presence of some of these forms. There is some significence in the fact stated by Bolton, that there is a diminution of numbers after much drawing from subterranean sources, but this he attributes mostly to the filtration.

From the behavior of known pathogenic bacteria, introduced into water, we get some valuable facts as to their action and destruction, but not such as yet inform us anything as to the conditions of natural waters. Even in our own country, these views have been emphasized by the experiments of Theobald Smith, Ph.B., M.D., in the Agricultural Laboratory at Washington. (See paper, *Med. News*, October 9th, 1886.) "The signification of the number and kind of bacteria still remains to be determined." He says "statistics collected from various cities in Germany and Austria, do not indicate the perfect concordance between biological analysis and former estimation of quality, which those would wish to see who have looked upon this method as more satisfactory than chemical analysis."

A knowledge of the various species of bacteria is a safer guide than their number, in estimating the quality of water. These facts will serve to show that we as yet have no occasion to frighten the public out of propriety, by finding 5,000 microbes in a drop, as has been the case in fairly good water in London. We have no doubt that we are in the region of valuable facts, and that valuable indications will yet appear. We hope to see the time when the facts of the clinician, the biologist and the chemist can so be brought together and compared as to give valuable results. Even now, from these, there are reasons for cautions and precautions. But on the other hand, we are willing to use our facts for what they are at present worth, and not to alarm beyond what is just and right.

ORGANISMS OTHER THAN BACTERIA FOUND IN POTABLE WATER WHICH MAY AFFECT IT.

Plants and Animals.

It has often happened that waters which are for a time satisfactory, come to have sudden changes in taste and smell as well as in organic purity. This may be owing to changes in the origin of supply or in the reservoir and apparatus of distribution. Various animals and plants may choose locality in the storage-places of water. Some facts as to this were noted in our seventh report (1883), pp. 156–188, by Prof. Leeds. A fresh and condensed statement is made as to these changes and some remedies by G. H. Parker, the biologist of the Massachusetts State Board of Health, in its nineteenth report (1887). We quote as follows from the summary as given by the Secretary:

"Three classes of plants are found in our ponds and reservoirs. First, those which are fixed in the basins, such as the common pond weeds and a few filamentous algæ. Second, those which are suspended in the water, but do not readily decompose, including the common green algæ (*desmids*, *diatoms*, &c.) and duck-weeds. Third, those which are suspended in the water and readily decompose, the blue-green algæ (*Cœlosphœrium*, *Anabœna* and *Clathrocystis*).

"Plants firmly fixed in streams and basins are harmful mainly in affording a lodging-place for the development of plants belonging to the groups two and three above noted. In basins having much fluctuation of level, plants of the first group may injure the water by their death and consequent decay.

"The floating plants of the second group are injurious, since, after a long carriage through a closed conduit or in continued hot weather, they die and decompose. In Boston water, taken from a tap, they are usually dead; in Cambridge they are usually alive in the water taken in the same way, and offend only the sense of sight.

"The members of the third class multiply very rapidly, and secrete a jelly, which, together with the plant, readily undergoes decomposition. These plants usually decay in the basins, and are represented in the water drawn from the taps only by a few fragments.

"Of animals, two classes may be mentioned: the fixed or sessile forms, and the free-swimming. Of the latter, the *entomostraca* are the only troublesome forms, and these mainly in the hot weather, when the rate of reproduction is very high. Of the sessile animals two are noteworthy, the fresh-water sponge and the polyzoa. The latter usually encrust the gates and open ends of pipes. One gelatinous form lives in the ponds—sometimes free, sometimes attached.

"The comparative small number of the polyzoa and their hardiness render them generally less important than some of the other organisms. The sponges are undoubtedly the most troublesome of the animals found in water-supplies. They readily decompose and strongly taint the water. They are now conspicuously absent in the sources of Boston's water-supply.

"Some of the lines upon which relief from the nuisance occasioned by these organisms may be sought are the following: Fixed plants can be cleared from ponds by the usual methods of raking. Improvements of the ponds by deepening and removing the loam will probably do much to check the growth of plants in groups two and three.

"In Mr. Parker's preliminary report will be found some observations upon the changes undergone by water from one locality, under the different conditions of storage in a filter gallery, in an open and in a covered reservoir. These observations have a great practical value, and demonstrate the value of covered reservoirs as a protection against the vegetable life which seems to be the ordinary source of the disagreeable tastes and smells so common in our ponds and reservoirs."

LAUNDRY AND DISH-WATER SLOPS.

While there is a general admission that organic animal matters in a state of decay are injurious, it is not unusual to find it asserted that ordinary kitchen and laundry slops, as discharged into small brooks, are not injurious. This question has come up in several of our towns where some small brook or ditch, almost dry during the summer, is made to receive the slop-water from many houses. While it is admitted that in some states of the atmosphere it causes odor and discomfort (which of itself should condemn the practice), it is claimed that no harm to health can follow. Some time since, the Secretary was called to a nuisance in Clark township, Union county, where complaint had been made of a nuisance caused by cesspools in which no urine or fecal matter was received. It was noticeable that what is known as the sewer-smell was present. In fact it is quite certain that the sewer-smell so familiar to all Health Inspectors is not caused by human or animal excreta, but more by the greases and gases of slop and laundry decomposition. In order to have some chemical evidence upon the subject, Prof. H. B. Cornwall, of Princeton, was asked to make analyses of slop-water such as could be secured in the neighborhood. The following is the result:

TESTS ON LAUNDRY AND DISH-WATER SLOPS.

"Slops taken from my own and a neighbor's house were kept a few days and then tested for *free* and *albuminoid ammonia.*

	Per 100,000	
	Free Am.	Alb. Am.
Laundry slops (family of six persons).	9.7	6.08
Dish-water—dinner plates, &c. (family of six persons)	6.4	1.86

"A drinking-water containing 0.015 of albuminoid ammonia per 100,000 is ordinarily to be condemned as containing an unsafe proportion of organic matter, regardless of any specific disease germs, &c., possibly present. *Free ammonia* above 0.005 per 100,000 is regarded as indicating, in general, an unsafe contamination by organic matter. It is evident that the above slops would seriously contaminate any source of drinking-water, unless very largely diluted. After standing a few days they both acquired a very offensive odor, and evidently contained much putrefying matter.

"The analysis of such highly impure compounds is quite troublesome, owing to the necessity of several trials to fix the proper dilution with pure water for making the actual analysis."

It will be seen that these results confirm the testimony of the senses and of experience. The Secretary, several years since, in taking up pipe on his own premises, into which only slop-water and laundry-water passed, found the pipes choked, and sent samples of the accumulation to Prof. Austen, of New Brunswick. The analysis showed the foul greases of soaps returned to their original state, gases of decomposition and various forms of debris, which proved the compounds to be even worse than the usual excreta. My own experience as to very many cases of this kind is that the fouled waters of kitchens and of the laundry are as hazardous as water fouled with animal excretions, with the exception that they are not so likely to contain the specific poison of such a disease as typhoid fever. But when it is remembered that laundry work often includes clothing soiled with excreta, and that all slop-water quickly passes into stenchy decompositions, it must be claimed that all such liquids are to be regarded as dangerous to health.

SEWERS AND SEWERAGE.

In the last report an exhibit was made of four prominent systems of sewers and sewage-disposal, in order that some comparisons might be made between them and with any other methods. It is more and more evident that several systems have merits, and that generally preference is to be determined by the locality, the size of the city, and various other considerations.

Thus, whether the storm-water shall enter the sewer depends much upon whether or not it is well carried off by the contour of the surface, upon the character of the soil, &c. Whether the sewage shall discharge into a river must depend much upon whether the stream is rapid or sluggish, whether it is near the sea, upon the amount of sewage, &c. Whether land shall be used for filtration, or whether in substitution for it, or in addition to it, mechanical and chemical methods of subsidence and clarification shall be used, is also a relative question. As to all these, it is well to know that they are fully understood and properly weighed by all competent engineers. There is no more divergence of opinion than there is in any other department of scientific or practical planning and laboring. Indeed, it can be said that all the details of the removal of waste liquids are now so well understood, and the plans are so feasible and the outlay so much less than formerly, that there is no excuse for our continuing to live amid the waste and decaying products of civilization.

PROGRESS IN THIS STATE.

During the past year, the progress in this State has been very marked. Trenton as a large city, and Mount Holly as a smaller one, have both illustrated the feasibility of different methods. Plainfield has had a full report on a projected system of sewerage, and several other cities or towns have either begun or are preparing to carry forward a sewerage system.

MORE RECENT IMPROVEMENTS.

The two most important facts of more recent date, as to dealing with sewage as with polluted water, are—first, what has been found as to the disposal of sewage in the ground; and second, the effect of methods of subsidence and purification.

I. Formerly it was supposed that when water was agitated in, or exposed to air, or when distributed over land for filtration, that the chief change wrought, depended on the oxidizing effect of the air. Robert Warington, chemist of the Royal Agricultural Society, England, showed that much of the change is due to living organisms, by which nitrification is produced in soil and in water. This life does not act, as a rule, over two feet from the surface. In a clayey subsoil, very little of this bacterial life is found under two feet of the surface. His various experiments have been confirmed by Schloesing, of France, and Frankland, of England. The chief lesson is, that for all land or ground filtration and purification, we must depend upon the upper ground, and that decaying material which we desire to get clear of by natural processes, must be left very near the surface. Also that it must be loose ground, since the purification is a process of oxidation, of which the products are carbonic and nitric acids.

II. As to methods of purification by subsidence and chemicals, while it was admitted that much organic matter was removed, it was contended that no method would remove the minute forms of microphytic life, *i. e.*, micro-organisms. Facts now, however, show that they are removed. If not directly, they are deprived of their food or pabulum, and so cannot remain. Dr. Percy F. Frankland, in a large series of experiments with the London water-supply (see "Water Purification, its Biological and Chemical Basis," Pro. Ins. Civil Engineers, Vol. LXXXV., London, 1886, and various papers in *London Sanitary Record* since), shows that filtration does remove a large percentage of bacteria. The same is shown as to chemical precipitation. The same has been shown at the Berlin water-works, where the efficiency of the filter-beds is determined by the percentage of bacteria which they will remove. Experiments at the Lawrence Experimental Station, Mass., have confirmed these views.

Our chief lack at present, is, that we cannot so classify bacteria as to know which are harmful and which are useful, or if we could, do not know how to remove the one and leave the other. But the fact that the water is improved by the wholesale removal, is a practical one, applying both to water-supply and to sewage that is to go into streams not large and not favorable to its complete disposal.

RESULTS OF THESE VIEWS.

In view of all these facts, the system of land filtration has been rendered still more effective. Where land cannot be had, on a similar principle, subsidence and chemical treatment are made available.

Where sufficient land cannot be had, the two methods are made to supplement each other, the sewage being treated before its transfer to the soil. As a fresh illustration of the value of *Chemical Treatment of Sewage*, we abstract as follows:

"MM. P. Charstaing and E. Burillot have contributed to the Proceedings of the Académie des Sciences a carefully-prepared account of the results obtained in Brussels by the method of rendering sewage innocuous by treatment with chemical reagents. In the course of their paper they remark that for the purpose in view there are two methods in actual use: '1. The method of irrigation, or the purification of sewage by means of the soil and cultivation—a method which is widely advocated and available when command can be had of large expanses of land adapted to this use, and when the water which has to be purified is not highly charged with putrescible matter. 2. Chemical methods, which have for some years past fallen into great disrepute, but which, in consequence of advances recently made and still possible in chemical science, demand a careful consideration.'

"They continue: 'The first method has been much studied, we may say studied exclusively, in France. This very circumstance has led us to examine the value of the chemical methods, believing as we do that in the public interest no single plan which may contribute to the public health ought to be overlooked or neglected. Many methods of effecting the chemical purification of effluent sewage-water have been proposed. The effluent water of the city of Brussels has been analyzed with a view to determining (1) its composition, and (2) the alterations produced in its composition by chemical treatment with a view to its purification. The analysis gives the following result:

"'SEWAGE-WATER OF THE CITY OF BRUSSELS.

				Taken from the mouth of the collectors.	*Purified.*
Appearance				Turbid	Limpid
Odor				Nauseous and ammoniacal	None
Chemical reaction				Very alkaline	Slightly acid
Dry residue per litre				5.357 grammes	0.697 gramme
Mineral matter				3.826 "	0.587 "
Organic matter, &c.				1.531 "	0.110 "
Suspended matter				1.000 "	None
Composition of the organic matter dissolved in 1 litre of water	Nitrogenous	Ammoniacal	Free ammonia	0.560 "	None
			Ammonia salts	1.510 "	0.011 gramme
		Nitrates		0.082 "	None
		Organic	Crystalloid	0.082 "	0.010 gramme
			Albuminoid	0.332 "	None
	Total nitrogenous matters			2.434 "	0.021 gramme
	Organic carbon			Not determined	Not determined
Composition of the mineral matter dissolved in 1 litre of water	Alumina			0.200 gramme	0.030 gramme
	Sesquioxide of iron			0.080 "	0.005 "
	Lime			None	0.300 "
	Magnesia			0.050 gramme	0.030 "
	Chloride of sodium			0.100 "	0.060 "
	Potash			1.970 "	0.087 "
	Silica			0.006 "	0.004 "
	Phosphoric acid			0.126 "	0.063 "
	Sulphuric acid (SO_4H_2)—in combination			1.344 "	0.068 "
Gas given off	Free ammonia			736.5 cub. centim.	None
	Sulphuric acid	By weight		0.0068 gramme	None
		By volume		4.5 cub. centim.	None
	Oxygen			None	5.00 centimetres
Composition of the mud suspended by the effluent water in the collecting mains. The water contains 1 gramme of this mud, comprising	Organic matter	Nitrogen (organic)		0.060 gramme	None
		Carbon Oxygen Hydrogen		Not determined	None
	Mineral matter	Lime Alumina Iron		0.351 gramme	None
		Phosphoric acid		0.120 "	None

"'1. *Organic matter.*—It will be seen from the preceding analysis that the effluent water upon the method of carrying away the whole of the sewage becomes very highly charged with organic matters, among which nitrogenous products predominate. The proportion of substances dissolved is about 5.35 grammes per litre in the effluent water of Brussels, whereas it varies in Paris from 2.59 in the Asnières main to 3.50 grammes in the Saint Denis main. There is a still greater difference in the proportion of nitrogen, for whereas the water in the Brussels main contains 2.434 kilogrammes per cubic metre of nitrogen in solution, and 60 grammes in the form of suspended matter, that of the Paris outfalls does not contain more than from 44 grammes at Asnières to 140 grammes at Saint Denis of nitrogen in all forms. Lastly, the weight of putrescible organic matter is about 2 kilogrammes per cubic metre in the water of the Brussels outfalls, and does not exceed 910 grammes in that of Paris. The effluent water at Brussels, after being purified by chemical processes, is limpid and inodorous; its composition, no doubt, shows that it would not be fit for domestic use, but it is so far pure that if turned into a river it could not give rise to any infection, and, furthermore, it contains a sufficient quantity of oxygen in solution to allow fish and vegetable life of high orders to develop in it. Is the purification by the chemical process more perfect than purification in the soil? Reference to publications made upon the subject of purification in the soil shows that water so treated after separation from solid sewage retains from $\frac{1}{44}$ to $\frac{2}{44}$ of its original nitrogen. The foregoing analyses show that the whole sewage treated chemically retains about $\frac{1}{116}$ of its original nitrogen, but what would this same water (undivided from solid sewage) retain after treatment in the soil?

"'2. *Mineral matters.*—The mineral matters held in solution in the water examined are of less importance than the organic bodies; it is nevertheless worthy of remark that 1 cubic metre of effluent water (in the whole sewage system) can furnish about 2 kilogrammes of potash and 100 grammes of phosphoric acid, whereas the effluent water of Paris only contains about 80 grammes at most of potash and 40 grammes of phosphoric acid.

"'3. *Gas in solution.*—The presence of ammonia in a free state, or held in feeble combination by carbonic acid, is a matter of great importance; sewage-water spread upon the land may, under certain conditions, give up this gas to the air, and 1 cubic metre of sewage may thus set free 736 litres of ammoniacal gas; moreover, volatile phosphoric compounds which are highly poisonous may be given off by this water, to say nothing of sulphuretted hydrogen and other nauseous and unwholesome emanations. In the chemical method these dangers cannot arise if proper precautions are adopted in the arrangement of the apparatus.'

"The authors then sum up their inquiry in the following results:

"'It thus appears to be clearly established: 1. That the purification of sewage by chemical means is perfectly practicable. 2. That it can be applied continuously and without the production of unwholesome emanations. 3. That the employment for agricultural purposes of the nitrogen, potash and phosphoric acid contained in the sewage can by this method be easily effected.'"

Speaking, therefore, with confidence as to the ability of our engineers, chemists and sanitarians to direct communities as to proper methods of construction of sewers and the disposal of sewage, we desire to emphasize the following points:

I. No system should be adopted on the advisement of a non-expert committee, however intelligent, but some competent person should be held responsible for the choice of a plan adapted to the locality and to the population.

II. There is need of skilled supervision in carrying out all details of construction, as well as in all joinings to the system, made from dwellings, factories, &c. Contractors, householders and plumbers, with all their excellent intent, cannot be trusted to get all things just right.

III. There is need of thorough administration and sanitary inspection.

If all of our cities, towns and villages will thus act, diminished sickness and death-rate will repay expenses if, as to these, too, proper oversight is exercised.

SUMMER HOTELS AND FIRE-ESCAPES.

The burning of one of our summer hotels, at Point Pleasant, and the cremation of one of the guests, may well call our attention anew to a subject noted in our fifth report, 1881, p. 25. The burning of the Parry House, at Beach Haven, and of the Mansion House, at Long Branch, may well be recalled. Any one familiar with the way summer hotels are generally constructed, and, indeed, with most of the house-construction at sea-side resorts, should realize that the buildings are extra-hazardous. The law as to fire-escapes should be rigidly enforced. See Chapter CX., Laws of 1882; Chapter XLI., Laws of 1886, and Chapter CXLIX., Laws of 1888. The first two laws should be made to apply to two-story buildings, although the general terms of the law of 1888 would probably apply it to all boarding-places. Many of the buildings, not only in our summer resorts, but in our cities, are very unsafe. Guests should examine as to fire-escapes, and Local Boards should see to it that the law is enforced.

VACCINATION AND RE-VACCINATION.

The subject is ever old and ever new—ever old, because for over a century the evidence of its necessity and potency as the preventive of a terrible disease has been shown—ever new, because so many neglect the boon of this great protection. In the sixth report, 1882, we furnished papers and reports from some of the best authorities, which really covered all that was then known upon the subject.

So thorough had been the observations and investigations up to that time, that very little that is new can be added. But there is need of line upon line, precept upon precept, as to a matter that so seriously affects not only individuals, but the welfare of large populations.

The chief advance in our knowledge has been by way of accumulation of evidence. By reason of some opposition had in Great Britain to a law of compulsory vaccination, and of the existence of a society which regards this as an invasion of personal right, physicians and sanitarians have been led still more closely to collect and analyze the facts collected from various nationalities. Such a book as "Vaccine and Variola," Churchill, London, 1887, or "The Truth about Vaccination," of Ernest Hart, London, shows how thoroughly the whole subject has been investigated and how fully the value of vaccination has been established. The former is especially valuable for its bibliography.

The two questions of more recent prominence are, From whence shall the vaccine lymph be derived? and, How far is re-vaccination necessary? As to the former, it can confidently be said that bovine lymph has fully established its value and, to most minds, its superiority. Some prefer its general use after having passed through the arms of one or two healthy subjects, while others prefer the calf lymph taken directly. There are now reliable sources of supply, as referred to in our circular on Small-pox and other Communicable Diseases.

It is not admitted that this has to be used to the exclusion of all other lymph. Dr. Snow, of Providence, and others have shown how far what is known as the Jennerian lymph is still reliable, and how groundless are the fears as to the conveyance of any human disease if only the plainest precautions are taken. At any rate, there is now no reason why the family physician, who is trusted as to the character of his medicines and his judgment, should not in this also be trusted. There is no reason why every child in America should not be vaccinated during the first year of its life, unless some possible exception is advised by the medical attendant. As to re-vaccination and its necessity, there has been some change of professional opinion. It is now recognized more than formerly that for various reasons there may be a failure of constancy in the protective power of vaccination. Some modifications are found to arise by reason of too small a number of pustules, of the condition of the person at the time the operation is performed, and by reason of the exhaustion of the effect after the lapse of a few years, for reasons that we do not understand. Strict methods have shown that there are very many unskillful vaccinators, so that in consequence of imperfect vaccinators very many have been nominally vaccinated who are not protected.

Dr. Buchanan, of the Local Government Board, Great Britain, has recently issued a memorandum on the subject of re-vaccination, which so far expresses the correct view that we quote from it as follows:

"Evidence of the additional protection against small-pox given by a re-vaccination can be found abundantly by any one who chooses to seek for it. It can be got from the experience of re-vaccinated communities living in the midst of communities not re-vaccinated, as in the case of the permanent officials of the postal-service living in London; or it can be got from the experience of nations, differing in their small-pox death-rates as their laws for re-vaccination differ; witness the contrast between the German and Austrian rates of small-pox mortality since the time when Germany, but not Austria, enforced re-vaccination upon children of school ages. Or evidence to the same effect is to be had by observing the immunity from small-pox, for year after year, secured to nurses in small-pox hospitals by re-vaccinating them before entering on their service. This last is perhaps the most obvious of all such examples; and in the few instances where there has seemed to be exception to the rule of their immunity, it has almost always turned out that the requisite re-vaccination had been by some chance omitted.

"The re-vaccination which is proper to be done for every child ought to be a matter of regular system; done as regularly, it were to be wished, as primary vaccinations are done for infants. There should be no waiting until an alarm about small-pox is raised. The importance of these considerations will be obvious to any one who considers the conditions for the proper performance of re-vaccination. The lymph has to be obtained from cases of primary vaccination; it must not be taken from cases of re-vaccination; it ought to be used in the freshest possible state, and, whenever practicable, direct from the primary vaccine vesicle.

* * * * * * * * * * * *

"*Medical and sanitary officers and the medical profession generally are therefore invited to urge upon parents and guardians the importance of having their children re-vaccinated at the age of twelve years or thereabouts, and to urge upon all persons beyond this age who have not yet been successfully re-vaccinated the duty of obtaining for themselves the additional protection which may be had by this means.*"

It has been practically applied in Prussia in the case of the army, which has lost but one soldier by small-pox in thirteen years. The English law recognizes the need of re-vaccination after twelve years of age.

The memorandum states that with the best lymph 96 per cent. of re-vaccination ought to be successful. This is higher than with us, since we have been much in advance of Great Britain in the preservation and use of bovine lymph, and have been equally skillful in the operation. Yet there are many failures in vaccination and re-vaccination which ought not to be.

We have not and do not seek a law of compulsory vaccination, but with the power given to boards of education and school trustees under our laws, no children should be in any of our public schools until able to show a certificate of vaccination, and re-vaccination may be required where deemed necessary. (See Chapter LXVIII., Laws of 1887, or Circular LX., page 19, Sections 22 and 23.)

Physicians, too, in their common duty as citizens should, by the use of the circulars of this Board, or by other means, strive to secure the protection of vaccination to the families in their charge. Local Boards of Health should make this an especial part of their duty, and from time to time distribute brief circulars as to it. It is bad in principle and in policy to wait for an epidemic in order to secure immunity. This of all others is the one disease that never ought to occur. Under the enforcement of military orders often not a single case occurs, and similar experiences are numerous to the degree in which communities avail themselves of this protection.

DISINFECTION.

The value and the modes of use of the various disinfectants have been sufficiently presented by this Board in recent reports, as well as

Circulars XLIV. and LXIV. of this Board. There is still need that attention be drawn to two points:

I. The imperfection of their use. We have so many "dabs" at sanitation. A physician tells the family to disinfect and what material to get. He has no time to oversee the mode of use, and in fact in the practical details of method generally does not know and cannot be expected to know. How many physicians know how properly to fumigate a house, and perform all the details of cleansing after an epidemic? How many can tell just how, and how much of, a disinfectant has been used in the last case of typhoid fever? Now, all this proves that generally the execution of the work should be put in charge of some competent person. In cities the Health Inspector should usually be sent for, either that he may do the work, give item directions as to it, or see that it is properly done.

II. The second error is in relying too much on disinfection. It can never take the place of systematic and enforced isolation in some diseases. It cannot take the place of prevalent and persistent cleanliness. Most of all, the one great reliance is *pure air*, and there can be no substitute.

We direct attention to a very suggestive article read before the American Climatological Association, September 20th, 1888, by Prof. I. T. Whittaker, M.D., of Cincinnati, on "Conditions which Tend to Render the Atmosphere of a Locality Aseptic."

He ventures the assertion, and goes far towards proving it, that small-pox, scarlet fever, measles, typhus fever and relapsing fever, aside from accidental direct contact with cases, are not ever contracted in the open air. We can imagine an exception in some close street or alley of a city, but the fact has far less exceptions than generally imagined. The garment that has been shaken out of doors does not hide contagion. Pure air is the enemy of such contagions as come from within, as most of them do. The infected house must be turned inside out, as to all its movables, and practically so aired as to be out of doors. Add to this the following directions, and no disease would be likely to become epidemic.

Let us describe a place selected for the habitation of man and erect a house which is to remain, as far as possible, aseptic:

"It will stand facing the sun on a dry soil in a wide, clean, amply-sewered, substantially-paved street, over a deep, thoroughly-ventilated and lighted cellar. The floor of the cellar will be cemented, the walls and ceiling plastered and thickly whitewashed with lime every year, that the house may not act as a chimney to draw up into its chambers micro-organisms from the earth. Doors and windows, some of which extend from floor to ceiling, will be as abundant as circumstances permit, and will be adjusted to secure, as much as may be, thorough currents of air. The outside walls, if of wood or brick, will be kept thickly painted, not to shut out penetrating air, but for the sake of dryness. All inside walls will be plastered smooth, painted, and, however unæsthetic, varnished. Mantels will be of marble, slate, iron, or, if of wood, plain, and whether natural, painted or stained, varnished. Interior woodwork, including floors, will all show plain surfaces and be likewise treated. Movable rugs, which can be shaken daily in the open air—not at doors or out of windows, where dust is blown back into rooms—will cover the floors. White linen shades, which will soon show the necessity of washing, will protect the windows. All furniture will be plain, with cane seats, perhaps, but without upholstery. Mattresses will be covered with oiled silk; blankets, sheets and spreads, no comforts or quilts, will constitute the bedding. Of plumbing, there shall be as little as is necessary, and all there is shall be exposed, as is the practice now. The inhabited rooms shall be heated only with open fires, the cellar and halls by radiated heat, or, better, by hot-air furnace, which shall take its fresh air from above the top of the house and not from the cellar itself, or the surface of the earth, where micro-organisms most abound. There will be 'house-cleaning' twice a year. Put into this house industrious, intelligent and informed men and women—absolutely essential conditions—and as much will be done as at present may be done to prevent the dissemination from it of contagious disease, when an inmate brings it home from a septic house, hospital, sleeping-car, school-room, theater, church, &c."

AIMS OF HEALTH BOARDS.

While there is so much ground for congratulation, in view of the sanitary progress made by our Local Boards, let us remember that we fall very far short, in actual administration, of many of the cities of our own country, and of many in foreign countries, especially in England.

I. There is generally not enough money provided for an economic and successful sanitary administration.

II. There is need of more thorough system and greater promptness in removing garbage, filth and all various decomposable matters.

III. While administration should be on the alert for the removal of nuisances, it should do far more for their prevention.

IV. House-to-house inspection is not frequently enough, or systematically enough done, and does not lead always to action such as is demanded.

V. Inspectors are not trained properly in their duties, and too often make only verbal reports.

VI. Vaccination, circumspection over articles offered for sale, plumbing and various other matters, are not enough provided for.

VII. Cities of over 20,000 inhabitants should always have public baths, a public apparatus for disinfecting clothing, a contagious-disease hospital, prompt reports of cases of contagious disease, a garbage destructor, an ambulance, a supply of disinfectants and all the various conveniences now recognized as needed for the protection of the public health. While we must move only so far in advance of public opinion as to be within influential distance of it, we must see to it that we educate the people, both by precept and by showing the actual results of efficient sanitary practice.

As to vital statistics, important as they are, they are not utilized as they should be, unless consulted each week, and compared from month to month and year to year, in order to indicate the abiding-places of disease, so that local causes may be discovered and removed.

SANITARY QUESTIONS AND ANSWERS.

In the tenth report of the Board, 1886, pp. 46–58, a series of questions and answers was given, which has been found very useful by Health Boards and Inspectors. They afford ready direction to those who are not fully educated in the details of sanitary administration. We here add to these a few more, which will be found convenient for reference.

"*Q*. If asked to advise upon the proposed drainage of a town, what would be the chief points to which you would direct your attention? Explain what would be the conditions which would limit your choice of outfall.

"*A*. Its situation with regard to a suitable outfall, its population, manufactures, water-supply and annual rainfall, its geographical features, having regard to gravitation, and desirability of adapting separate system and intercepting sewers, geological features, as to construction of sewers and method of treatment of sewage, and ventilation.

"The conditions limiting choice of outfall would be the want of proper discharge for effluent—unsuitability of land rendering it impossible to discharge an effluent of the required standard; the position of the town might be such as to render it difficult to obtain an outfall without expensive pumping machinery, and the possibility of having to enter into the district of another local authority, and the violent opposition always given to the establishment of sewage outfall works, and some other points.

"*Q.* What is meant by the separate system of sewerage? In what circumstances would you advise it?

"*A.* The separate system of sewerage is that by which the storm or rain-water is carried off by a separate drain from that used for the sewage proper. Its adoption is advisable in hilly towns which are very subject to heavy storms, and in low-lying towns with much subsoil-water (as the drain could be utilized for draining the site on which the town is built), also where the ultimate treatment of the sewage is to be by mechanical means or irrigation, it is mostly advantageous to exclude as much water as possible, there generally being found as much liquid in the sewage as is requisite for carrying purposes, and any addition thereto only adds to the expense and detracts from the efficiency of the purification. There is a great deal to be said on both sides of the question, which have each their advocates; for instance, where the separate system obtains, there may be often a want of water for flushing, and after storms a very large quantity of objectionable matter may be carried into the storm-water drain, whose possible outfall being in a stream or brook, would carry the contaminating media thereto, to the common danger of persons or cattle using the water.

"*Q.* How is water filtered on a large scale for town supply?

"*A.* Water for the supply of large towns is filtered by being passed through mechanical filters constructed somewhat as follows: The water is sometimes first passed through a subsiding tank, where the solids are allowed to settle, is then discharged into a filtering reservoir; the bottom layer of the filtering medium consists of clean gravel gauged to about the size of a walnut, from 1 foot to 1 foot 3 inches deep; the second layer, gravel broken to a gauge of the size of horse beans, about 6 inches deep; the third layer, gravel broken to a gauge the size of peas, same depth as before, and fourthly, a layer of gravel, 6 inches deep, size of buckshot. This is topped with from 2 feet to 3 feet of clean sand, and upon this surface the water is distributed, whence it percolates through the sand and gravel into brick collecting drains, and thence into the pure-water reservoir or pump-wells. To efficiently filter the water, it should not be allowed to pass the filter quicker than at the rate of about fifty gallons per superficial foot of area of sand surface in twenty-four hours, and require frequent cleansing, which is done by removing a small quantity of the top layer of sand, which is thoroughly washed and again used after exposure to atmospheric influences.

"*Q.* The site on which a town-house is to be built is very damp, and is to be underdrained by land drains. Explain in detail how this should be done?

"*A.* To underdrain a damp site it is requisite to excavate a number of trenches at such depth as circumstances may require, in which should be carefully and truly laid a series of unglazed pottery field-pipes having butt joints. These pipes should be covered with a thickness of clean gravel, admitting the percolation of subsoil-water into the pipes. In some cases it would also be requisite to carry a drain entirely around the outside of the building. The discharge from these drains (if in the country) might be into a water-course, if in town they should be first led into a trapped disconnecting chamber or gully, discharging into the house drain or public sewer. It is imperative that ample means of ventilation should be provided for these land drains, the upper ends of which should be in communication with the open air, thus admitting a free current to flow from the intercepting tank up through the drains to their higher ends. This intercepting chamber should have the character of a ventilated man-hole sufficiently large to admit of thorough inspection. After the drains are laid and connected the whole ground should be thoroughly consolidated and then covered with not less than 6 inches of good Portland cement concrete, grouted to a smooth surface; or, better still, asphalted. If this work be well done there need be no fear of damp rising.

"NOTE.—There should be a thoroughly-ventilated space between the upper surface of the asphalt and the under side of basement floor, if of timber.

"*Q.* What precautions should be taken in basements of houses to prevent the walls being affected by damp? If the walls in an existing house show signs of damp, what means would you take to remedy the same?

"*A.* A thoroughly efficient damp-proof course—such as Doulton's glazed damp-proof course—or other impervious material should be inserted in the wall for its full thickness *above the level of the adjacent ground;* and if below the level of the street an area should be formed along such part as lies below the level, which area should be properly drained, or if this is not possible the wall may be built hollow, with a damp-proof course both at the top and bottom of the cavity, which must be drained so as to admit any percolation to drain away. If the damp was caused by rain percolation, coat the outside walls with Portland cement; but if the bricks be very porous rebuild with hollow walls, due provision being made for insertion of efficient damp courses. A great deal of damp is caused by want of ventilation.

"*Q.* What are the chief points to be attended to in ventilating rooms? Why is there so often a draught near windows, even when they are well constructed?

"*A.* That the external air be admitted at such a velocity as to avoid draught, and yet in such a quantity as to admit of an entire change of air three times within the hour, allowing about 1,200 cubic feet per hour per adult. It is incorrect to suppose a draught to exist in this case. The feeling of draught or cold is caused by the cooling of the body on the side next the window, due to radiation; the truth of which may be tested by drawing a curtain across the window, when the radiation will be checked and the feeling of draught disappear.

"*Q.* Describe some simple methods of ventilation which you would recommend for dwelling-rooms. Make a sketch showing a room suitable for fifteen adults.

"*A.* The most simple method of ventilation in a room is by the insertion of a strip of wood about three inches deep (fitting the whole width of the window) between the sill and the bottom rail of the sash. This admits of a corresponding opening between the meeting rails of the top and bottom sash, thus allowing a constant upward current of air and preventing any down-draught. This method is both cheap and effective, as it requires only a strip of wood, which can be removed at pleasure.

"Moore's Louvre and circular glass ventilators for windows are useful, easily fitted, and can be opened or shut at will.

"Another method is by the insertion of a 'Sheringham' ventilator, which, by its construction, spreads the air over the ceiling; the vitiated air being imperceptibly drawn towards the fire-place. The valve of this ventilator, being hinged at the bottom, remains open; but by a small cord attachment can be altered to any angle required, thus regulating the flow of air.

"Also by the use of 'Boyle's' patent mica flap (outlet) ventilators inserted in the chimney breast, discharging the vitiated air into the smoke flue. The valves, being composed of mica, are so light that the slightest current of air opens them. Immediately a down-draught occurs the valves close, thus preventing smoke entering the room.

"*Q.* If there is reason to suspect that sewer gas is escaping into a house, in what way would you proceed to examine the drains? And what points would you look to?

"*A.* First ascertain whether the house-drain is properly (*i. e.* entirely) disconnected from the sewer. Then if ventilation exists, whereby a column of fresh air is continually passing through the drain. Then if any defect in the drain itself, by bad laying or defective jointing, &c. And, lastly, if any defective sanitary arrangements existed within the house. To discover these defects it would be requisite to open out the drain between the house and sewer, as near house as possible. At this point introduce a smoke rocket, or asphyxiator, injecting smoke, the dense column of which, ascending the drain and all its ramifications, would at once show by its presence where any leakage occurred, and so localize the defect.

"There is another way by using a strong-smelling liquid, which, being started at the highest part of the drain, or in the topmost water-closet or sink, acts in a similar manner by appealing to the sense of smell. But this is in no way to be compared to the smoke test."

NEW JERSEY SANITARY ASSOCIATION.

The New Jersey Sanitary Association continues to be an important aid to the sanitary progress of the State. It brings together each year health officers, members of Boards of Health, physicians and prominent sanitarians. These are aided by chemists, engineers, plumbers and such other professional and intelligent citizens as can find time to attend. The number present cannot be large, but the papers read and the discussions are freely disseminated through the State by the press, while local officers learn much from each other as to methods of sanitary administration. It is urged upon all Boards of Health that they have a representative present, and upon Sanitary Inspectors that they do not fail to attend. The information derived is always of benefit to the localities from which members come. The expense of attendance is small, and no money is more profitably expended by the Local Boards or by individuals. This report always contains an abstract of its proceedings, but this cannot take the place of actual attendance.

STATE CHARITIES AID ASSOCIATION.

The State Charities Aid Association was incorporated March 26th, 1886, and by act of Legislature, passed April 13th, 1886, was authorized to make written application to the Justices of the Supreme Court for the legal appointment of Visitors, as needed, to visit charitable, penal or reformatory institutions. Its first members were chiefly the Morris County Charities Aid Association and a very few from other parts of the State. It was well fostered by this parent association, and made two reports, but it was not until this year that it came to have a clear and well-defined status and made its first report to the Legislature. While the work of this association has especial reference to a study of the management of institutions—of the best methods of dealing with the dependent or criminal classes, and the most effective methods for diminishing pauperism and crime—it also is very collateral to the work of this Board in its sanitary oversight of all such institutions. We welcome it as thus co-operative, as well as for its chief aims and beneficence, and bespeak for it the interest of all such as have at heart the physical and moral welfare of those who are the wards of the State.

THE STATE HEALTH LIBRARY AND LOCAL BOARD LIBRARIES.

While we do not need to purchase as many books as formerly, it is our effort to secure all important books and treatises on subjects related to sanitary science and practice. We receive about fifty volumes a year also as exchanges—many of them valuable health reports. Our last catalogue is contained in the fifth report (1881). We have been delayed in re-arranging Library by changes being made in the State House, but hope next year to present a full and better-arranged catalogue. In the meantime the Library is open to the use of all Boards of Health, and books on any subject will be loaned for two weeks, if the expressage both ways is paid. We desire, also, to encourage all Local Boards of cities to have small libraries of their own, and will, when we can, send duplicates of books which are sent to us, but are already in our Library. Each Local Board should be careful to have the State Reports, as they will be found to contain some information on almost every subject connected with sanitation. The index to all papers and subjects is contained in the last report (eleventh, 1887).

RELATION OF HUMAN AND ANIMAL DISEASES.

There has long been a recognition of the fact that there is a close resemblance between some diseases of mankind and those of the lower animals. For instance, the view was long ago entertained as to smallpox, that it is a disease which, communicated from man to the horse and then to the cow, becomes modified into kine-pock, or that a disease originating in the horse and communicated to the cow becomes cow-pox, or vaccinia. Even more definitely than this it was claimed that some animals could catch some of the diseases of man. It was, however, reserved for a comparatively recent period for us to be able to collect and analyze a sufficient number of facts to prove the communicability, or interchangeability, or identity of certain human and animal diseases, and to see the most important bearing of the facts secured upon the prevention and limitation of disease. Thus says Fleming: "Mankind has the aptitude to receive anthrax, rabies, foot-and-mouth disease, glanders, cow and horse-pox, diphtheria, and in all probability tuberculosis—not to mention the reception of entozoa and epizoa, entophytes and epiphytes, which give rise to morbid conditions, often of a most serious nature, in our own species."

As an illustration, we may best take the tuberculosis of man and animals. Before the able brochure of Dr. Creighton, of Cambridge (1876), there had been accumulating many observations that pointed to a relationship between human and bovine tuberculosis. His careful microscopical, histological and pathological investigations, with facts presented in evidence, seemed to make out a strong case as to the marked similarity and possible identity of the disease, as found in man and in the lower animals.

These have been followed by accumulated evidence derived from various sources. (See summary of same in the first annual report of Bureau of Animal Industry, Washington, 1884, pages 350–370.) A great interest was added to these investigations when tuberculosis in man, as also tuberculosis in animals, came to be claimed as, under some circumstances, infectious or transmissible diseases. So high an authority as M. Chauveau, of the Lyons Veterinary School, in recalling the recent researches which have led to considering tuberculosis as an infectious malady, says: "Foreseen by the illustrious Morgagni, and afterwards suspected by Andral and Laennec, the infectious nature of tuberculosis is now no longer disputable since the work of Villemin, of Koch and others." He then recalled the experiments of the school of Lyons, "the researches of which have placed the identity of human and bovine tuberculosis beyond a doubt. The transmissibility of a similar malady from one species to another is fertile in practical consequences." (See minutes of Congress on Tuberculosis, Paris, 1888.)

George Fleming, F.R.C.V.S., Principal Veterinary Surgeon of the

British army, in a letter to the *London Lancet*, April 7th, 1888, speaks thus: "The letter of Dr. Creighton, in *The Lancet*, once more draws attention to the most important subject of bovine tuberculosis and its relationship to tuberculosis in mankind and other creatures. * * * Dr. Creighton is right, so far as I know, in ascribing to Klencke the first published notice of the communicability of the malady to mankind by means of the milk of 'scrofulous' cows."

"But the evidence rested only on clinical observation, and though the cases he adduces appear to warrant the conclusion he arrives at, and though, also, in recent years, similar observations have been made public, yet they are not absolutely convincing that the human species can be, or has been, so infected. But clinical observation and most careful experiments on animals have gone far to demonstrate that infection of mankind by the flesh and milk of tuberculous animals is possible—nay, very probable. And in this demonstration members of the veterinary profession have played a very important part, though Villemin, of the Val de Grâce Hospital, Paris, in 1865, and again in 1866, led the way in experimental investigation. Soon afterwards Gerlach, then principal of the Hanover Veterinary School, undertook a series of experiments, which were conclusive as to the communicability of the disease to various species of animals. At the same time (1868), Chauveau, then at the Lyons Veterinary School, instituted experiments which had the same results as those of Gerlach, and proved beyond doubt that the disorder could be conveyed not only by inoculation, but also through the digestive apparatus. Chauveau was, I believe, the first to indicate the danger of allowing the flesh of tuberculous cattle to be utilized as human food. The veterinarians, Harms, Günther, Bollinger, Bagge, Zürn, Semmer, St. Cyr, Jolin, Leisering, and others, experimenting in the same direction, all reached the same conclusions, and, with Toussaint, of the Toulouse Veterinary School, undoubtedly showed that flesh and milk were infective.

"So strong and so startling was the evidence thus accumulated, and so alarming did the matter appear with regard to the public health, that in the *British and Foreign Medico-Chirurgical Review* for October, 1874, I called attention to its urgency, gave the chief facts—clinical and experimental—recorded up to that time, and concluded the paper as follows: 'From what has been already ascertained, there is every reason to view with grave suspicion the use of the flesh of phthisical cattle as food, especially if the disease is much advanced and the tissues are generally involved. But with more reason the milk from cows affected with tuberculosis should be prohibited, more particularly for the use of infants, who mainly rely upon milk for their sustenance, and whose powers of absorption are very active. Even if this milk did not possess such dangerous infective properties, its deficiency in nitrogenous matters and in fat and sugar, and the increased proportion of earthy salts, would alone render it objectionable as an article of diet. It has long been known that it was liable to produce diarrhœa and debility in infants; but, though many children fed on such milk may have died from general or localized tuberculosis, the part probably played by this fluid in its production has not been suspected.' Since that time I have seized every opportunity of insisting upon the danger of tuberculosis in cows, in *The Veterinary Journal*, in public addresses, and especially in my work on 'Veterinary Sanitary Science and Police' (Vol. II.), published so long ago as 1875, I have earnestly endeavored to point out the destructiveness of the disease among cattle, and the peril to which its extensive prevalence exposes our own species."

At the recent meeting of the British Medical Association, at Glasgow, August, 1888, Professor Edgar Crookshank, of London, the distinguished microscopist and biologist, read a paper on "Tuberculous Cows' Milk." Dr. Crookshank regards "the tubercular bacillus of the cow as identical with that found in man. In view of the fact that milk from tubercular udders must frequently come into the market, he considers that immediate legislation is demanded. In reply to Dr. Coals, Dr. Crookshank said that the disease of the udder was not a mere local condition, but part of a general tuberculosis. Its importance, however, consisted in the fact that if the udder was unaffected, the bacilli were not found in the milk. Professor McCall, of Glasgow, thinks that he has seen the disease transmitted from tuberculous cattle where no disease in the udder could be found. Professor Crookshank stated that the opinion that there was any difference in size between the tubercular bacillus, as found in bovine and human tuberculosis, as held by Klein, was probably due to the fact that Klein had examined bovine tuberculosis only in sections. The bacillus as found in tubercular milk has quite the same size and appearance as that found in tubercular sputum. Inoculation experiments with sputum and milk gave the same lesions and the same bacilli in rabbits." The significance of all these views is greatly emphasized by the proceedings of the "Congress on Tuberculosis of Man and Animals," held in Paris from July 25th to July 31st, 1888. It commanded the attendance of three hundred members, almost every country being represented.

While the veterinary profession was the more largely represented, eminent medical authorities united in their testimonies. The papers and discussions took a wide range as to the evidences of tuberculosis and its modes of propagation in man and animals. Experimental and chemical evidences were adduced. The character of the proceedings and the eminence of many of the authorities have given to this Congress a large consideration from the medical profession, and by all sanitarians. The tone of professional opinion is well represented in the two following extracts from editorials—the one from the *London Lancet* of September 1st, 1888, and the other from *The* (Philadelphia) *Medical News* of September 8th, 1888:

"The recent Congress on tuberculosis, held at Paris, under the presidency of M. Chauveau, affords a striking illustration of the widespread interest that is taken in, as well as of the importance of, an accurate study of this disease. The keynote of the proceedings was contained in the affirmation by M. Chauveau that now, thanks to the observations of the past twenty years—from Villemin to Koch—we have been awakened out of the false security of believing in the innocuity of tubercle, and recognize the grave possibilities of its transmission from animals to man. Throughout the whole of the discussion there was hardly a dissentient voice against the contagiousness of tuberculosis. One speaker after another rose to affirm his belief in the dangers to the human race arising from the consumption of the milk and flesh of tuberculous animals—and this, too, from various countries—so that it is not surprising that the Congress should have adopted resolutions aimed especially at the hygienic precautions to be taken in this respect. It recommends the inclusion of tuberculosis in the list of contagious diseases of animals, and the seizure and destruction of the flesh of every tubercular beast, no matter what may be its appearance. It declared that such resolutions were applicable to all lands, since in every part the question of tuberculosis presents the same problems. Moreover, the Congress urged the spread of popular instruction, especially in country districts, respecting the precautionary methods for preventing tubercular contagion, the risks which are run by the infection of meat and milk coming from tuberculous cattle, and the measures to be taken for the disinfection of materials derived from phthisical patients. Lastly, the Congress held it imperative that dairies and dairy farms should be rigidly inspected.

"Thus, then, we have it categorically affirmed that tuberculosis is not only a contagious disease, but that one of its chief means of prevalence in mankind is by communication from animals of the bovine species. Yet, in spite of the evidence in favor of this view, the question is one which has not been absolutely proved. Experimentation has demonstrated without cavil that animals fed upon tubercular flesh, or inoculated with the virus or the bacillary cultures in every possible way, become victims to the disease. Morbid anatomy long since proved that within the body tubercle may spread from part to part by a process of infection. There are isolated cases of the accidental inoculation of human beings, with the resulting development of local tubercular lesions; and, lastly, there are a few instances where the disease has every appearance of having been directly transmitted from one individual to another. Nevertheless, the vast amount of tubercular disease, in one form or another, in which there is absolutely no evidence of its acquisition by infection, may well make us pause before assenting to propositions which, of necessity, imply that everywhere and in all circumstances the disease is transmissible by contagion.

"At the same time, while recognizing to the full the great lack of unimpeachable clinical evidence in support of the transference of tubercular disease from man to man, together with the grave obstacles in the way of measures to prevent contagion among the community, to say nothing of the inhumanity which would follow their adoption, it does seem highly rational to check the consumption of articles of food which are proved to be derived from tuberculous animals. * * * We regard the meeting of this Congress as very important. It has given an impetus to the study of tubercular diseases which must bear fruitful result. It has demonstrated how great is the change that has taken place in our conception of this class of disease, and we do not doubt that from every point of view—hygienic, therapeutic, surgical as well as medical, and pathological—much gain will accrue; whilst we may look forward to 1890, when the next meeting will take place, under the presidency of M. Villemin, in the hope that in all these respects a distinct advance will have been assured."

"At the recent French Congress for the study of tuberculosis, certain propositions were presented by the President, M. Chauveau, and adopted, which relate to special prophylactic measures necessary to be observed in dealing with the contagious diseases of domestic animals, especially those which may be transmitted to man. The French government, upon the adjournment of the Congress, with commendable alacrity, adopted regulations suggested by the action of the Congress, which are to be enforced for the prevention of the transmission of tuberculosis from animals of the bovine species. Cattle are to be placed under the supervision of sanitary veterinary surgeons, and animals found to be tuberculous are to be isolated and sequestrated, and when killed must be killed in the presence of the Inspector, who must make a post-mortem examination. Meats obtained from such animals, when the lesions are definitely ascertained, are excluded from sale, and are not even to be fed to animals, but must be destroyed. The sale of milk from tubercular cows is forbidden, though after being boiled it may be fed to animals. * * *

"Tuberculosis being recognized as a contagious disease, and in all probability transmissible from animals of the bovine species to man, it is the duty of the State or general government to enforce stringent measures directed against the spread of this disease, and forbid the sale or use of meats from animals affected by it. As it is probable that infection is conveyed by alimentation, particularly by milk, the sale and use of milk from tubercular cows should be forbidden. In the absence of such a regulation, or its enforcement, safety lies in the practice of boiling the milk before using it."

"The President, M. Chauveau, finally presented the following propositions, which the Congress adopted:

"1st. It is necessary to place in the jurisdiction of the Boards of Health all questions having a relation to the contagious diseases of domestic animals, including even those that to-day do not appear to be transmitted to man. To vaccinia, glanders, hydrophobia, malignant carbuncle, tuberculosis, other infectious diseases can be added later, which will necessitate the same precaution.

"2d. It is necessary to use every possible means, including indemnities to the owners, for the general application of the principle of seizing and destroying totally all meats derived from tubercular animals, whatever may be the extent of the specific lesions found on those animals.

"3d. It is necessary to print simple instructions which are to be distributed in all cities and villages, and in which are contained the methods to prevent tubercular infection by alimentation, particularly by milk, and the manner of destroying the virulent qualities of the germs contained in the sputa, linen, beds, &c., of consumptive patients.

"4th. The cow-houses must be especially placed under the watch of an Inspector, especially those that produce and furnish the milk used in alimentation, so that the contagious diseases from which they may suffer should not be communicated to man.

"5th. That tuberculosis be inscribed in all the sanitary laws or regulations of the world, as a contagious disease, necessitating special prophylactic measures."

(See further, as to the relation of human and bovine tuberculosis, Creighton, Transactions of International Medical Congress, 1881; Fleming on Tuberculosis, Pamphlet, Baillere, London; Tuberculosis, Drs. McGee and Klophel, Memphis, 1886; Bovine Tuberculosis, *Blaine*, Willard Asylum, N. Y.)

While we are of those who are slow to accept as proven any evidence of communicability not certified by clear and abundant clinical evidence, surely enough has been adduced to show that we have reached a period when greater precaution should be used. When the world-wide prevalence of consumption is recognized, and while our last national census shows it first in frequency in the list of deaths from all diseases, we cannot be too much on the alert in recognizing the relation of the condition of the flesh and milk of the bovine species to the extension of the disease. It is always to be borne in mind that if a disease is shown to be communicable it may also be shown to be difficult of communication. Or it may be shown that it is only communicable when it finds its proper surroundings and a proper soil, and that these are only found where there is neglect of proper sanitary precautions, or where the individual, by a proper hygiene, could be protected from susceptibility; while, if the specific microphyte is the *contagium vivum*, we should use every precaution to remove or destroy it. We are also to bear in mind that there is a positive and encouraging field of operation, in rendering places and persons unsusceptible to attack. We have thus singled out human and bovine tuberculosis as fairly representative of diseases probably identical in men and animals, and probably communicable under some circumstances.

These observations are rendered of great importance, not only because of the gravity of the disease, but because tuberculosis is so prevalent among milch cows. A moderate English statement claims that from fifteen to twenty per cent. of all cows are affected. In this State we have very frequently found the disease. It appears chiefly in stables where the cattle are tied in rows, and where ventilation is defective. The per cent. stated is larger than with us, but not larger than we believe to be the average in city dairies.

The facts should lead physicians to an inquiry as to the milk used by children; and often precaution will require that it be boiled. Also, it should be urged upon the attention of our legislators that this and other animal diseases hazardous to mankind are on the increase. The first effective measure of prevention to be adopted is competent veterinary inspection of all milch cattle kept in city limits. Boards of Health should be charged with this duty. The public have little idea of the number of city-kept cattle, and of the fact that a large proportion of them are diseased. If only city dairies could be properly cared for, we would soon diminish tuberculosis and other diseases.

We are to remember that this tuberculosis is far from standing alone. There are at least fifteen diseases of mankind and of other animals in which relationship and probable interchangeability are claimed.

Two observations besides those as to tuberculosis are especially worthy of note. In the tenth report (1886) of this Board, page 63, and eleventh report, page 421, we noted the observations of Power and Klein as to the identity of scarlatina with a disease discovered in cows. These were afterwards disputed by Crookshank. A series of cases reported recently by Dr. Russell, Health Officer of Glasgow, as to an outbreak at Garnethill, bear a striking analogy to the Hendon cases. The milk-supply of every family was inquired into. One hundred and seventy-two families, supplied by Dairy X, yielded ninety-five of the cases of illness, while 1,301 families, supplied by other dairies, yielded but one case. A close inquiry and analysis of facts showed that milk X was not infected through a human medium. An examination by Dr. Russell and others revealed in the cows appearances resembling those described in the Hendon cases. Other experiments are being made, and it is too early to decide the full significance of these facts. It is, however, of import that Sir James Paget and various members of the Epidemiological Society of London accept the view that in some cases scarlet fever is derived from a disease occurring on the teats of cows.

As to the communication of diphtheria from the lower animals, a sufficient number of facts have not yet been observed and classified. It is noted that disease among chickens, quite similar to diphtheria, often prevails at the time of an outbreak of diphtheria in some isolated family. Thus, Dr. Turner, of the Local Government Board, England, "considers this mode of diphtheritic distribution possible," and cites cases to show that outbreaks of diphtheria have, in more than one instance, been coincident with the occurrence of "strangles" among horses. He also found in some of his official inquiries that when diphtheria was present in a district, the fowls suffered from fatal throat affections. (See *Sanitary Record*, June 15th, 1888, and July 16th, 1888.) Dr. Delthill claims that the frequency of diphtheritic affections in and near Paris is owing to the presence of badly-kept poultry. The same has been claimed by several observers here in this country. (See Prof. Whitaker, *Medical News*, Oct. 6th, 1888.) M. Menzies attributes an outbreak of diphtheria at Posilippo, near Naples, "to the patients having drunk water from a well into which the excrements of numerous fowls and pigeons had been washed by the rain." (See *British Medical Journal*, April 28th, 1888.)

The fact that cats are often the carriers of contagion seems well established, but recently Dr. Low and Dr. Turner, of the Local Government Board (1887), have adduced some significant facts to show that cats impart and contract diphtheria. (See article, *Sanitary Record*, June 15th, 1888, page 553.)

As to various other alleged intercommunicable diseases, we do not need to speak at length. In 1869 Dr. Thorne discovered that the milk from cows suffering from foot-and-mouth disease was capable of producing disease in those who partook of it. The fact is now fully recognized by all English physicians. Actinomycosis is probably transmissible. Anthrax and glanders have long been recognized as thus communicable. (See, as to various animal diseases that are communicable, article by Ezra M. Hunt, M.D., first report of Bureau of Animal Industry, Washington, D. C., 1884, pages 437–444.) Unusual prevalence of boils has seemed to be traceable to the use of diseased meat. When we consider our relations to animals, and some of the facts adduced, together with the well-known aptitude of milk as the conveyancer of the specific poison of several diseases, we may well be on the alert in studying the relation of animals to the human diseases with which we, as sanitarians and physicians, have to deal.

LAWS TO WHICH THE STATE BOARD OF HEALTH HAS RELATION.

The most important law to which the State Board bears relation is that found in Chapter LXVIII., Laws of 1887, and also to be found, with explanations, in Circular LX. issued by this Board.

While quite similar to some previous laws which it repealed, it is improved in order and clearness, and made fully to conform to the decisions of the higher courts. It secures a uniform health administration for the whole State, and is believed to be the best health law to be found in any of the States.

LAW AS TO VITAL STATISTICS.

Second only in importance to this is the law as found in Chapter XXXIX., Laws of 1888. It, too, is a consolidation of former laws, with such improvements as are indicated by the progress of statistical knowledge and the decisions of the courts. Circular LXV. of this Board contains the law with all needed explanations.

LAWS AS TO ADULTERATION OF FOODS AND DRUGS.

The first general law as to adulterations is to be found in Chapter CCXVII., Laws of 1881, and in the supplement thereto, Chapter CXXXIX., Laws of 1883. It is fully explained in Circular LIX. of this Board.

Our reports show considerable work done in former years under this law. But experience showed us that any such law had both commercial and health aspects, and that as a practical fact the prevention of admixtures and substitutes not injurious to health, but injurious as commercial frauds, would necessarily make up a large part of the work in the execution of this law. The special appropriation made for the execution of this law was only $1,000, which was not at all adequate to the wide scope which the full enforcement of the law would require. Accordingly, this Board has of late confined itself mostly to inquiries into adulterations harmful to health, or to instructing Local Boards as to their rights of control. This was all the more proper because an examination of the work of foreign analysts, and of such elaborate reports as that made by the New York Committee of Analysts, showed comparatively few dangerous adulterations. Thus, President Bayles, of the New York Board of Health, in a letter to Mayor Hewitt (1887), says:

> "The experience of this department has been that cases of hurtful adulteration of food and liquor are comparatively rare. The adulterations usually encountered are made in the interest of bulk and cheapness, and the materials used for this purpose are seldom in any other respect hurtful than that they are likely to be indigestible. In the case of liquors, even of imitation of wines into which no grape juice enters, it has been found that if the alcohol is eliminated, only the fruit syrups of the soda fountain remain.
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> "For many years the officers of the department have discharged their duty in this matter vigorously and intelligently, and with marked benefit. It is difficult, if not impossible, to find on sale in New York a sample of confectionery with poisonous coloring or flavoring. There has also been a marked improvement in the character of the milk and meat-supply of the city, and such adulterations as are known to exist are simply frauds on the purchaser. As frauds they do not come under our notice."

This course was all the more indicated because the State created the special office of Milk Inspector and passed special laws to prevent the fraudulent changing of the article which had been tampered with more than all others together. (See Chapter LXXXII., Laws of 1882, and various supplements, as referred to in Circular LIX.) Since then another special law as to adulteration has been passed, viz., the Oleomargarine Law, Chapter LXXXIV., Laws of 1886. The officer under this law is known as the Dairy Commissioner, and the Milk Law is also under his jurisdiction. In addition, Chapter CXXVI., Laws of 1887, confers on the Dairy Commissioner the same power which the State Board has under the law as to the adulteration of foods and drugs. An appropriation of $10,000 was made, which, with the amounts received from fines, is under the direction of William K. Newton, M.D., the Dairy Commissioner, and provides for the effective execution of these laws. His zeal and efficiency in the execution of these laws are well known. The State Board of Health appoints the Dairy Commissioner, but his official authority and his work are entirely independent of the Board. We are thus properly left to look after the direct health administration of the State, and after so much of the law as to the adulteration of foods and drugs as shall detect frauds directly hazardous to the public health. The examination of water, and of any foods or drinks from which any sickness is suspected to have occurred, are therefore attended to by us. Local Boards may either have such examinations made, or, if reported to us, they are likely to be made in all cases of well-grounded suspicion.

The rarity of cases thus reported and the examination of the reports in those States and cities where a public analyst is provided, show how comparatively rare are adulterations by poisonous or hazardous substances. During the past year we have had occasion to examine several cases of suspected water-supply. In one case scarlet fever was suspected to be caused by an eruption of the teats of cows, and a consequent contagion from the milk used. The suspicion was not verified by the examination. Samples of jelly-cake and of cheese have also been examined. The cases are comparatively few in which adulterations are alleged to have caused sickness or death, but these are promptly attended to by the Board. Still, there is need of vigilance, and we ask the aid of all Local Health Boards in this service.

LAWS AS TO ILLUMINATING OILS.

The first law to regulate the sale of petroleum and its compounds is to be found in Chapter CLXVIII., Laws of 1883. It was amended and made more effective by Chapter XCVII., Laws of 1883.

The law was executed with vigor, and finally commanded the co-operation of all the standard companies. Both on account of the methods used and because of new interests of the trade, oil for inside lighting which will not stand the flash-test prescribed in the law is seldom offered for sale. Accidents have very greatly diminished, and those that occur are generally not from explosions, but from the use of kerosene for kindling fires. Nevertheless, Local Boards should never let an accident occur without inquiry into the details, and should either make examination or present us such facts in evidence as will lead us to order investigation.

The law is fully explained in Circular XLII. of this Board.

LAW AS TO PRACTICE OF MEDICINE AND SURGERY.

This law, Chapter CXCIX., Laws of 1880, and supplements thereto, require that in the County Clerk's office of any county in this State in which any one begins the practice of medicine, he shall file a copy of his diploma, or a certificate instead, in case of practice for twenty years in any one place in the State. This Board has no relation to the law, except that County Clerks are required to furnish to the State Board of Health each year the names, &c., of all who have thus filed diplomas. These lists are published in the annual report.

LAWS AS TO CONTAGIOUS DISEASES OF ANIMALS.

The laws as to contagious diseases of animals are explained in Circular L. of this Board. Many important facts as to various communicable animal diseases are also given. Since, however, this circular was prepared, the principal law has been restated, and is to be found in Chapter CCXXV., Laws of New Jersey, 1886. The law as to glanders is to be found in Chapter XLIX., Laws of 1884. As the United States Government has made appropriation for the stamping out of pleuro-pneumonia in the United States, and as our laws could not reach the adjacent States from which the chief infection in this State occurs, arrangements have been made, under the law and with the approval of His Excellency the Governor, by which, with consent of the owner, the purchasing and slaughtering may be done by the United States Veterinary Inspectors. The right of quarantine could not be transferred, and this Board still exercises oversight and has report of all cases of the disease.

Besides these, there are various laws affecting the public health, as to which this Board is consulted by Local Boards. The most of these are enumerated in Circular LX.

LAWS AS TO PLUMBING.

The important law as to plumbing, Chapter LVI., Laws of 1888, is properly placed under the direction of Local Boards. All necessary facts as to it will be found in Circular LXV. of this Board. A recent discussion of master plumbers in Philadelphia, on a resolution "That all soil-pipes inside of houses should be tested," contains so many suggestions that we insert it:

"The question of the different kinds of tests was then taken up. William S. Clark explained the test recommended by the Inspectors of the Board of Health. Mr. Clark said: 'A favorite test for terra-cotta pipe is to stop up the outlet to the sewer and fill the pipe with water. If the pipe stands that strain it is all right. My experience has shown this test to be a very severe one. The joints on terra-cotta pipes will not stand much strain. In one case I was called on to fix a drain which ran through a cellar. Every time it rained the water backed in from the sewer and the pipes leaked. I took up the pipes, relaid them, and filled the joints with the best Portland cement. When I stopped the outlet in the pipe and filled it with water all the joints leaked. I took out the cement and used another kind, which I let dry for a week before allowing any water to run through the pipes. I didn't apply the test, but I suppose it is all right, for I haven't had any complaint since.'

"John Worthington, who believes in the sulphur test only, said: 'It is not the material used but the poor workmanship that causes complaint. In the last six months I have found many reasons for complaint. I have found bells that were broken in calking, traps unseated, and where solder should have been putty and red lead were used. I am here ready and willing to uphold the craft, but the plumbers have not done their duty. The day has come in Philadelphia when they will be forced to do it, and I am glad *The Times* has had the courage to come out and manfully tell us we must do better work. The question naturally arises, "How are we to know when we have made a good job?" Some may say by test. I have tried every known test and none gives the satisfaction the smoke or sulphur test does. We do not want a pressure on the soil-pipes. If water is used and there is a break in the pipes the house is flooded and damaged.

If air-pressure is used the pipes are not only strained unnecessarily, but the water is blown out of the traps. With the sulphur or smoke test we have the result at once.

"'No matter how reliable the workman may be, he is never sure the work is properly done until it is tested. After a man had finished some work in a bath-room he assured me it was tight. I applied the smoke test and in four minutes I had that room so full of sulphur smoke that no one could live in it, although the opening was no larger than a pin's head. Other things we want to look after are the joints. If a joint is made with putty and red lead it is sure to crack. All joints should be made with solder when possible. What we want to do is to look after the fixtures which are covered up and hidden out of sight. In our tests we do not need a pressure, but we want some test which will show at once where the leak is.'

"'I am opposed to terra-cotta pipes being used inside of houses,' said Harry Coffin. 'All soil-pipes should be of iron, with leaded joints, and I think we should adopt a better standard than that which pipe-makers are now throwing on the market. I am in favor of hydraulic tests for all work, and I think when it is found to be all right under pressure it certainly cannot be faulty when the pressure is relieved.'

"John E. Eyanson was in favor of abolishing terra-cotta pipes altogether. He said: 'I think all soil-pipes should be tested first under pressure when they are laid. When the work is completed I would have the work proved. If house-drainage is to be tested, and it should be, we must do away with terra-cotta pipes for all inside work.'

"'I am not in favor of the hydraulic test,' said John J. Weaver. 'What we want is a test which can be applied with safety in a furnished house as well as in a new building. Suppose the pipes should break in a furnished house. Look at the damage that would be done before you could get the water out of the pipes.'

"Mr. Worthington then described a house he had been at work on. 'With the sulphur test I found thirty-seven leaks in one hour, and the smoke filled the house from the cellar to the garret. I found it coming out of the foundation walls, and through six feet of solid earth in the cellar. The place was in a miserable sanitary condition. If water had been used to test these pipes the whole house would have been flooded and the plumber would have had a big bill to pay.'

"'I am in favor of a smoke and air test,' said William Harkness, Jr. 'I have used this test for over a year and it has given satisfaction every time. I think a slight pressure should also be used and the air and smoke forced into the pipes at a pressure not exceeding one pound to the square inch. I used this test at a house on Camac street, and the gentleman moved out because his pipes were in such a bad condition. The smoke came out of every joint.'"

The New York Board of Health now requires plumbers to apply the air-pressure test to plumbing work, in the presence of the Inspector, by means of an air-pump and pressure-gauge. The water department does not issue a permit for water in the house until the certificate of such test is produced. Boards of Health should be familiar with the various health laws of the State. We gladly furnish full information as to them and the practical modes of enforcement.

LEGAL DECISIONS.

The health legislation of the State is now so fully authenticated that these laws are likely to be fully sustained. There will no doubt arise cases where, either by irregularity of procedure or by reason of insufficient ground for action, Health Boards will not be able to sustain their complaints. But where the law has been conformed with, or where ordinances are properly drawn and administered, the laws are clear and operative.

Various decisions of importance are now on record in the court reports of the State, with which the Boards and their legal advisers are easily made familiar. We append reference to two cases merely as illustrative of the increasing consideration given to all health administration, as belonging within the limits of police regulation.

Thus, John R. Hardin, attorney of the Board of Health of Newark, in its last report, speaks thus:

> "There was pending at the time of my appointment a *certiorari* to the Essex Pleas, taken to raise the question of the validity of the Board's ordinance concerning night scavengers and their work. This *certiorari* was argued at the June Term of the Supreme Court, by Mr. McDonald and Mr. Conover for Chas. Holzworth, the plaintiff in *certiorari*, and by your attorney for the Board. A decision was rendered in November in accordance with the views advocated by the Board, directing the Essex Pleas to dismiss the appeal, and leaving the judgment in behalf of the Board in the police court unaffected.
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> "This decision was an important one to the Board, because it practically recognized the Board as an independent body, the court deciding that the ordinances of the Board were not *city* ordinances, and that the provisions of the city charter, applicable to a review of a police court judgment on a suit for a penalty for a violation of a city ordinance, had no application to a similar suit for a violation of a health ordinance."

The Hon. John P. Stockton, the Attorney-General, in his annual report for 1887, speaks thus:

> "Other matters, some of them of grave importance to the interests of the State, have required the attention of the Attorney-General's office. Prominent among these was a suit brought by the Newark and South Orange Horse Railroad Company against the State Board of Health, to recover the sum of $20,000, the alleged value of a large number of horses belonging to that company, and which had been destroyed by the agents of the Board as being infected with glanders; the foundation of the suit being the alleged want of power on the part of the State to authorize the destruction of private property without making compensation for it. It will be seen that this case involved the question of the constitutionality of the various acts of the Legislature creating the State Board of Health and defining its powers. The importance of this branch of the State government is at this day so thoroughly understood that the absolute necessity of resisting an attack upon it which, if successful, will destroy its existence, must be apparent to every one. Careful attention, therefore, was given to the preparation of this case, and it was thoroughly argued on the part of the State at the last November Term of the Supreme Court."

The opinion rendered at the February (1888) Term of the Supreme Court, in sustaining the constitutionality of the law concerned, has important bearing on all health administration and abatement of nuisances.

We quote from the opinion as rendered by Justice Magie, as follows:

> "There is nothing in the decision in Hutton *v.* Cowden, or in the learned and well-considered opinion of the Chief Justice, which gives the least countenance to the notion that the Legislature may not authorize the abatement of a common nuisance, until after its character as a nuisance has been determined in a judicial proceeding, with the safeguard of notice and opportunity to the property-owner to be heard. Such a doctrine enforced by the courts would interpose an almost absolute barrier to the praiseworthy efforts everywhere made to prevent preventable disease, and to stamp out contagion and infection affecting public health and comfort, and would render much of the health legislation of to-day of no avail. But I think it cannot be claimed that the rights of a property-owner will be improperly interfered with by legislation authorizing the abatement of nuisances of this character, although in advance of a judicial adjudication, provided such an adjudication, with notice and full opportunity to be heard, is not

denied, but may be evoked and compelled. As has been said in this court, every property-owner holds the title to his property subject to the paramount consideration of the health and safety of the public, and the power of the Legislature to fix upon it, when in certain conditions, the brand of noxiousness to public safety or health. If his property, in common with other property of the same sort, has been legally declared to be subject to destruction, when in certain conditions, noxious to the public, he cannot complain of its destruction if it was, in fact, in those conditions. It has never been pretended that the fourteenth amendment marked the abolition of the common-law rule which justified any one specially affected by a nuisance in abating it, without waiting for an adjudication that it was a nuisance which he might abate, but unless the fact of the nuisance was established by proof, he was liable to the aggrieved property-owner as for an unwarranted trespass. The amendment was, in my judgment, likewise ineffectual to prevent the State from providing, under its police powers, for the immediate abatement of public nuisances actually existing, though not yet judicially adjudged nuisances. In such case the officer entrusted with the power of abatement could not be protected if he destroyed property without the existence of those conditions which make it a common nuisance, and justify its destruction. But if the property-owner is not deprived of a right to contest the existence of such conditions, and to obtain redress as for a trespass, if they are not shown to have existed, such legislative acts would not infringe any constitutional provision.

"These acts being of the character above indicated, are not open to this objection."

These and various other cases and opinions show the intent of the law, and will sustain Local Boards in their action, subject, of course, to review as to the fact of nuisance.

THE SANITARY NECESSITY FOR THE CONTROL OF THE CONSTRUCTION OF DWELLINGS.

BY HENRY MITCHELL, M.D.,
President of New Jersey Sanitary Association.

The house has, until recently, been almost wholly excluded from the hygienic safeguards which State authority has, in many other particulars, gradually thrown about the citizen.

Notwithstanding that the dangers to health which exist in ordinarily-constructed dwellings have long been known to sanitary science, and have been faithfully pointed out and the remedies plainly indicated; and although it is in the house that more than two-thirds of the life of every family is passed, yet the oversight necessary to render safe and healthful this—the unit, the very center of sanitary interest—has been neglected or withheld.

The early history of sanitary legislation is a record of occasional attempts to overcome the military, financial and commercial evils which attend considerable outbreaks of disease and unusual mortality.

But these efforts ended with inefficient quarantine restrictions, which retarded true sanitary progress by unnecessarily embarrassing commercial communication, thereby creating popular antagonism and opposition to further attempts to prevent the spread of disease.

No consideration was given to the healthfulness of human habitations, although the great pestilences and frightful mortalities of former centuries were mainly due to unhygienic conditions in dwellings and towns.

Overcrowding and improper disposal of domestic refuse produced malignant outbursts of epidemic disease. Famine followed as the result of pestilence, and death and devastation seemed destined to depopulate the cities of Asia, Africa and Europe.

The improvement in the public health in London, following the great fire of 1666, which destroyed the greater portion of the miserably-constructed houses in that city, attracted general attention to the influence of filth in promoting disease, and the gradual application of the lesson then learned—the making of wider streets; the building of larger, dryer, better-lighted and better-ventilated dwellings; the disposal of household waste by better methods—has forever driven away certain types of disease which were once very prevalent.

Public appreciation of the value to the State of good health and normal longevity in the citizen, and the application of sanitary principles, have been very slow compared with the accumulation of knowledge on this subject, and individuals—not the State—have demonstrated the value of hygiene.

The present status has only been reached after repeated occurrences of rare and striking epidemics, together with many exhibitions of the usefulness of preventive measures, and the unanswerable arguments furnished by the records of vital facts.

Governments have shown more energy in developing industrial resources than in the preservation of human life and health. Geological surveys; the improvement of plants and domestic animals; the study of meteorology, have all had attention, in response to the persistent demands of representatives of mining, agriculture, commerce and other business pursuits. Sanitary interests, however, have not yet joined together and united their forces to the degree which must obtain before determined, increasing and effective measures are universally put in operation for their furtherance. When we consider the frequent and convincing demonstrations which have in recent years been made, of the economic as well as humanitarian features of hygiene, there seems to be a relic of barbarism displayed by statesmen who give precedence in statutes to business and social concerns, and show indifference toward the means which are known to promote health, and which can be rendered available only by aid of legislative enactments.

The attitude of governments, whenever they have adopted hygienic measures, has seemed often to be half-hearted—merely conciliatory to the wishes of advocates of sanitation, instead of evincing an unbounded faith and confidence in the supreme advantages to the people and to the nation, to be derived from legal provisions which shall secure pure air, pure water, good drainage and safe dwellings.

When such legislation is provided, it is rarely accompanied by a requirement that funds essential to its enforcement shall be appropriated; the execution of such laws is left to seek its own solution.

The progress now making in America, in the introduction of public water-supplies and sewer systems, indicates a rapid development of the sanitary idea.

The permanent purity of the water supplied, and the future safety of the sewage disposal, may not have received, in the haste attending the sudden grasping of a discovery, requisite consideration in all instances, but in the agitation which is aroused upon these questions, and in the willingness of citizens to submit to a tax for these safeguards, a promise is implied that defects and errors in primary construction will be corrected when they present themselves.

But a public supply of pure water and a perfect system of sewers will not avail in lowering death-rates, if avenues of entrance into dwellings, for sewer-air, are permitted to exist, and if polluted wells remain in use.

The accumulation of waste liquids upon premises will pollute the air of the vicinity, but who will contend that the conditions are improved if we cast these liquids into a sewer and give the sewer-air access to our sleeping-rooms?

Few persons are so thoughtless and negligent of health that they would contentedly dwell over an open sewer, yet large numbers of houses have sewer connections which conduct sewer-air directly to the inmates, in a form more concentrated and dangerous than any gases which may be wafted from cesspools, yards or open ditches.

The question may be asked, and it very often is asked, "If house-drains are frequently inviting and open avenues for entrance into the house for foul air, why do any of the occupants of any such houses escape illness?"

It is justifiable to reply that "none do." The degree of damage to health and the type of the disease may vary greatly, but no one who habitually breathes air loaded with the products of animal and vegetable decomposition will long continue in sound health.

The palid face, tired expression and inelastic movement of certain families, and in some instances of whole communities, indicate, as well as can words, a history of bad living.

Impure air and water stamp their marks upon human beings who subject themselves to these influences, inducing chronic invalidism in due course, even if none of the causes of specific disease chance to be present in the inhaled or imbibed nastiness. If, however, the special cause of any one of the filth diseases is present in such air or water, the consequent illness assumes a recognized character, and inquiry into the source of the trouble, and an effort to remove it, are sometimes made.

But the doctrine of sanitation is prevention, and instead of waiting for the occurrence of disease, and the fatal results which can, with perfect certainty, be predicted, hygiene demands that inquiry as to the safety of conditions affecting health shall be made in advance of injury, without delaying for additional harvests of sickness and death to show anew that filth is the home and reproducing ground of a great group of the enemies of the human race.

An examination of 200 houses in Chicago, in which diphtheria existed, showed that but four of the whole number were perfect in their sanitary arrangements.

The epidemic of typhoid fever in Brooklyn, in 1885, was traced to faulty connections between houses and sewers.

The health officer of one of the large interior cities of the State of New York has recently investigated an outbreak of diphtheria, and he states that in nearly all of the houses where the disease existed, the drainage was so defective that it permitted gases to freely enter the house from the street sewer.

Here were the occupants of these houses breathing, for years, emanations from a putrescent mass, and struggling along under their neuralgias, sore throats, diarrhœas, &c.; easy victims to every depressing influence; incapacitated for good service in any department of mental or physical labor; not available to the State as soldiers or statesmen, but liable to become objects of its charity—all because of lack of protection which the State only is capable of affording.

If these cases were exceptional and few in number, it might, with reason, be regarded as of doubtful propriety for the government to interpose its aid; but the mortality from preventable diseases is over 5,000 yearly in New Jersey alone!

Failure, therefore, to put into operation measures for the arrest of this unnecessary slaughter is wanton waste.

Taking $1,000 to be the value of each life thus sacrificed, the annual loss, in money, for unnecessary deaths from the following diseases: diphtheria, 1,527; typhoid fever, 522; measles, 296; scarlet fever, 255; whooping-cough, 181, and small-pox, 5, foots up *$5,576,000.*

Add twenty-eight cases of needless sickness for each death, at a cost of $20 each, and the total yearly loss in New Jersey is *$8,698,560.*

If consumption is added, the annual loss to the State is not less than *$12,000,000.*

If the methods of disease-prevention, now well established and already in partial operation, could be extended to the whole State, the foregoing totals could be reduced fifty per cent. in twelve months. What sort of public economy is it which hesitates to supply the men and money necessary to stay this enormous loss?

In this State the Legislature has placed the responsibility for the saving of these lives upon local health districts; giving almost unlimited authority to councils and Boards of Health to use all reasonable means for the deliverance of their localities from the grievous incumbrance of preventable disease.

The appointment of a Local Health Board and the appropriation of a nominal sum for its use, is obligatory, but there the matter stops, in many communities.

Assuming that satisfactory health-protection can be obtained for an annual outlay of $500 for each 1,000 of population, it follows that *$639,000* will meet all of the cost of this work for the whole State. This sum is equal to a per capita tax of *fifty cents.*

Compared with the annual loss at present sustained, the gain—if sanitary administration was well performed—would be at least *$4,000,000* each year.

Precedent has been abundantly furnished for the requirement that the water-supply, drainage, ventilation, heating and lighting of houses should conform to established principles: that house-construction shall be regulated to an extent which will prevent danger from errors and ignorance in all that concerns their sanitary features.

If it is contended that dictation to the citizen as to the manner in which he shall build his house, is tyranny on the part of the State, and partakes too much of the character of paternal government, and is inconsistent with American ideas and institutions, then laws regulating marriage and forbidding suicide are reprehensible and unjustifiable; for in the latter cases private rights are invaded quite as despotically as they are in the former.

Details of house-construction, relating to the exterior and to the materials used in the structure, have long been controlled in many

American cities, for the purpose of securing stability and for the prevention of fires.

Is it more un-American to prevent illness and premature death in the citizen than to prevent his financial injury?

Intemperance in eating and drinking; indiscretions in clothing and in the habits of life, and numerous other hygienic mistakes and crimes against natural laws, must be deferred for adjustment; but dwelling-house construction, which has long been awaiting its turn for reform, has at last received an impetus, and it will now undergo a gradual revolution.

Formerly the courts held that—except in cases of misrepresentation—no damage should be awarded where unsanitary conditions in dwellings were found to exist by tenants, and tenants were expected to protect themselves by an examination of the prémises previous to occupancy.

The injustice of such a position seems to be recognized, for recently there have been judicial decisions allowing damages against house-owners for permitting unhealthful constructions or erections to continue, leaving the tenant responsible only for faults in domestic management and for unhealthful accumulations.

Sanitary supervision of the construction and condition of tenements, factories, hotels, and all other buildings in which persons dwell or are employed or entertained, and over which the tenants, employes and guests have no control, is particularly necessary, for in these cases the owner is generally personally attentive only to the extent of his financial interests, and the wretched ventilation, lighting, drainage and water-supply of many of these buildings are accountable for the headaches, impaired vision, rheumatism, consumption, &c., which embitter the lives of operatives, and help to make their expectation of existence only thirty-two years—the shortest of all classes of persons.

Assuming that it is admitted that government control of the construction of buildings is a sanitary necessity, the question arises, "How far shall such control extend?" 1. The safety of the site is of such vital importance to the whole subsequent hygiene of the house, that it surely should be required to be under supervision. It is well established that habitations resting upon a soil in which the ground-water level is low, are much more healthful than when they are built upon ground which is saturated with water. Few situations are in-capable of being made dry by drainage. In London the level of the ground-water has been lowered thirty-four feet, and the improved mortality rate in that city is, doubtless, in a measure due to this drying-out of the soil. 2. The sanitary properties of building material. 3. The prevention of the entrance into the house of ground-air and dampness. 4. Strength of construction and the avoidance of danger from fire. 5. Ventilation. 6. Lighting, heating, and the regulation of temperature. 7. Water-supply. 8. The disposal of waste. All of these features of the house should, unquestionably, be regulated to some degree.

Existing prejudice renders moderation essential to progress in the execution of sanitary laws.

Coming upon the masses as an innovation, the protecting hand of government is welcome only when its purposes are clearly comprehended, and its benefits to communities and individuals are fully understood.

A wise and cautious execution of the laws created for sanitary control is, therefore, essential to their popularity, and to their uninterrupted continuance and usefulness.

Inasmuch, however, as municipal Health Boards are made up of persons who, as a rule, serve under an unexpressed protest, and who have no desire nor intention to long continue in their unpaid official position, nor any disposition to permit an alienation of friends, nor to make enemies of their fellow-townsmen, the tendency is strong toward excessive moderation, and there is probably little danger that the cause of health-protection will suffer at their hands by reason of its requirements being too vigorously applied.

Observation shows that the other extreme is far more frequently reached. Indeed, there seems to be no immediate prospect that the present system of sanitary government in this country will develop an energy in applying sanitary principles which will secure the best attainable results.

In New Jersey not one of the local health districts employs a tithe of its lawful resources in bettering its unhygienic conditions.

The direction, therefore, in which our efforts should now turn, is to more efficient administration of the powers already conferred by the Legislature.

Doubtless, many and varied propositions are now in embryo, which will have for their purpose the improvement of the application of sanitary principles by aid of new laws.

But until local health districts shall more fully appropriate and more generally profit by the legislative favors already bestowed, new duties and new responsibilities will prove to be new burdens—not benefits.

Few municipalities have yet supplied to their health departments the first and most essential requisite for good execution of laws and ordinances, viz., a competent and industrious executive officer.

The purse-strings must open before thorough and intelligent study of local sanitary needs and constant personal supervision can be secured.

Unpaid services of this character, for cities and large towns, will be superficial of necessity, for men who are masters of state medicine will not donate their time and services; nor should they be expected to.

Efficient executive officers are becoming more and more valuable to their localities in proportion to the rapid advances now making in sanitary science, and to the increasing number of diseases which are found to be preventable.

To them is entrusted the application of the precautions which avert illness and maintain health. To the physician falls the duty of restoring those who become sick.

Preventive medicine and curative medicine both deal with human ills—each striving to prevent premature death and the sorrows and losses which it entails; and to the skill of the practitioners of these arts, almost every individual in this age will finally be indebted for some important service.

The physician, by an evolution which has required centuries, has been divorced from ignorance and superstition, and to-day he is no longer a superficial blunderer who has picked up a stray fact here and there pertaining to his profession, but he is trained from boyhood to combat disease in all the light of past and present knowledge.

Should the professor of preventive medicine be less empirical in practicing his art? No! for *certainty* enters rarely into methods of cure, while in the tenets of prevention there is little that is *un*certain.

Is it right, then? Is it business-like? Is it sensible to place unskilled persons in the executive office in health departments?

Sanitary inspection; its defects; its needs and the difficulties attending efforts to secure its improvement, have already been presented in various papers, and it has had our earnest consideration. But I trust this subject may have renewed attention in the future, and that some method may be devised by means of which a more satisfactory inspection service may be finally obtained.

Whatever may be the attainments of the executive officer of a Local Board, he is powerless to anticipate health dangers and maintain good conditions on premises unless he has the aid of a sufficient number of well-informed and industrious Inspectors.

Like some others of the new problems which are constantly presenting themselves in connection with the endeavor to advance the interests of hygiene, the efforts to improve the grade of Inspectors prove to be exceedingly perplexing.

Men who are intellectually suitable, will not prepare themselves for this service while there is no prospect that they will receive proper remuneration and ready employment. And there seems not yet to be any probability that Local Governing Boards will show appreciation of the usefulness of these officers, by voting the funds necessary to induce them to seek preparatory instruction.

But there is no market for any commodity which does not exist, and until competent Inspectors offer themselves, and the value of their service can be *demonstrated*, no demand for them will arise.

Chapter LVI., Laws of 1888 (to control the plumbing and drainage of buildings), was, in substance, presented to the Legislature four successive years before it became a law.

It was, on each occasion, opposed by plumbers who had not yet realized that personal registration is a creditable distinction—not invidious—and which is demanded because of a quickening in the public comprehension of the important relation borne by this class of artisans to the health of their patrons.

The physician and the pharmacist are none the less honored, nor is their business made less profitable, because they are required to place their names on an official record.

These latter classes of persons, and also mechanical engineers, are further required to possess written evidence of their having qualified themselves to pursue their respective callings; and one of the next steps in the future progress of State control of house-construction should be, and it doubtless will be, a requirement that no person shall practice the art of plumbing until he shall hold a certificate from a proper authority, showing that he is capable of skillfully performing the important work pertaining to his trade.

By the operation of this and other statutes, the next generation of master plumbers will find themselves ranking as professional men rather than as tradesmen.

Viewed strictly from the plumbers' business standpoint, there is good reason for the enforcement of this new law.

The dishonest plumber can no longer underbid the honest dealer. The drawings and specifications will—when reliable Inspectors shall have been obtained—be complied with, and they will no longer be construed by sharp contractors to mean poor material and poor construction.

The provisions of the statute referred to place a responsibility upon Local Health Boards which many have thus far shrunk from assuming. The difficulty attending the enforcement of the law is to secure, with the limited means at hand, the service of competent persons to pass judgment upon the plans presented for approval and to inspect the construction.

But this phase of the problem must work itself out in each community, and time will doubtless prove to be an element in its solution, for—as we have already seen—governing bodies are not quick to dispense sanitary benefits.

An English writer has said: "That the universal diffusion of common means of decency and health is as much the right of the poorest of the poor as it is indispensable to the safety of the rich and to the State, and that a few petty Boards and bodies—less than drops in the great ocean of humanity which roars around them—are not forever to let loose disease on God's creatures."

Comfort, convenience and artistic effects have, in recent years, received increasing attention in America in dwelling-house construction; this marked improvement in the architecture, decoration and furnishing of homes accompanying increase in wealth and education, and the development of refined and cultivated tastes.

In the erection of these improved structures the guidance of the architect is essential, and it is almost invariably sought.

He has, therefore, greater opportunities than any other individual for securing the building of houses which shall be sanitarily safe.

The owner may doubt the sincerity of other advisers, fearing that suggestions offered may needlessly increase the cash outlay, but in the architect he has a guide who—being paid to serve his (the owner's) interests only—will have a single-minded purpose and undoubted ability to design a *safe* as well as a useful and beautiful building.

But a considerable proportion of practicing architects are unfamiliar with the principles of hygiene which relate to house-construction!

At present there is no legal restriction nor regulation intended to secure proficiency in their art affecting this class of professional men, and it is to be hoped that the movement already inaugurated for protecting themselves against unqualified competitors, and for maintaining the dignity of their profession, will result in examination and registration.

The fourteen years which have elapsed since the organization of the New Jersey Sanitary Association, and since the report of the State Sanitary Commission, have been years during which the principles of hygiene have been receiving renewed and general acceptance in all civilized lands. They have witnessed, in America, a sanitary revolution.

The talents and labors of devoted Sanitarians have aroused the enthusiasm and enlisted the co-operation of a large number of the citizens of our State in behalf of sanitation, and placed New Jersey in the front rank in sanitary advancement.

But the noble and beneficent purpose—to secure protection against preventable disease—cannot be accomplished by sudden flight.

Like every enterprise of benevolence, every reform, its progress leaves a history of toil and discouragements, but the future—the safe appeal of truth to time—will crown greater efforts with grander results.

Asbury Park, N. J.

OUR CHARITABLE AND PENAL INSTITUTIONS.

BY EZRA M. HUNT, M.D.

First consider what these terms mean.

Society is divided into two-classes, the productive and deductive classes. Not that at any one time all of the profitable members of society belong to the productive class, but it is generally true that in the summary a valuable life has been more of a producer than a consumer. In this alone is progress, accumulation, success. Each individual is greatly concerned to know to which, in the adding up of his forces and his weaknesses, he has belonged. The same is true of each family. Still more is the State concerned to know which is in the majority and superiority, the productive or deductive classes. Even though the productive element is in preponderance, we must learn how many and how much of the other class has been a hindrance or a make-weight, and how far it can be removed. This is one of the greatest problems and highest studies of political economy, and as practical as it is profound. The State knows that its people are the *chief* of its material resources, or of its destructive deduction therefrom. So, not as a patronized philanthropy, but as a practical patriotism, we are compelled to watch and to reckon, to ascertain the relative proportion of these two great classes, the effect of the latter upon the former and how far these effects, where injurious, may be mollified or overcome. Ill health, poverty and crime are the largest deductions from individual and national prosperity. Realizing the need of health as an economic element, and how far it can be promoted by wise sanitary legislation and administration, this State has placed itself upon an efficient working sanitary basis. What has it done? what can it do in a similar way for limiting dependency and crime? These are the salient, radical questions of the period. We shall not tarry to note that the dependency represented by the almshouse and the crime represented by the jail and prison stand for a far greater aggregate of outside want and outside criminality than can be expressed or accurately reckoned.

As a matter of expense we have only to turn to the Comptroller's report for the returns of the different cities and townships and find that there is an outlay of tens of thousands of dollars yearly besides the expense of buildings, &c.

If we could extend the study to individuals in alms-houses, as has been done in other States, we would find how much of this dependency is the direct result of intemperance, or of failure on the part of the State to look after its idle and orphan children.

When we turn to the records of crime and follow these from the industrial uselessness of the person arrested, through all the expenses of courts and confinement, we get an aggregate outlay which makes up the bulk of our taxes, besides the serious inroads it makes upon the peace and progress of society.

It is thus that the care of the criminal and the pauper classes becomes of the very highest concern to the morals, the prosperity, the entire welfare of the State.

ALMS-HOUSES AND THE CARE OF THEIR INMATES.

One of the most impressive developments of charitable societies and institutions has been the fact that unless we are on our guard, our very attempt to aid certain classes of society, and to provide them food, clothes and other relief, tends to produce and perpetuate the very class we seek to relieve. There is always among our people a shiftless population not loving work, and seeking to secure subsistence for themselves or for their families in the way that will require the least expenditure of force, and give them the most leisure time for promiscuous loafing. So soon as such find out that charity will provide for them and their families, so soon there is a motive to inaction and consequent dependency.

Hence, our charity organizations, by relieving present need, and then following the applicant to his home, or ferreting out the causes of the dependency, or its pretense, and by lending a helping hand to self-support, and refusing aid where the dependency is really voluntary, have done much in the right direction.

It is on such a principle that all State, county, city and township provision for the poor should be made. There must be a system by which inquiry and visitation are made, and discrimination exercised. A rigid system must be put in operation, which will ever seek out those who should be helped, either in their homes or in institutions, which will exclude those who have no real claims, and which, even more, will plan for and help those who ought to be and can be made to be self-supporting.

Those who come into alms-houses must also have a close study of methods and plans as to their care, their occupation and, in many cases, looking to their temporary stay. We hope the time will come when most of the decisions as to who shall be in alms-houses or receive aid, and as to the classification and management of inmates, will come under the care of women committees duly appointed for such a purpose. What the State Charities' Aid Association has already done as well as what has been done by its efficient auxiliaries, is but an imperfect specimen of large possibilities for the future.

During the years in which it has been my duty to visit the charitable institutions of the State, it has been my privilege to initiate and secure many important changes, the value of which has been recognized by the immediate managers and by this Board. But as my duty was primarily and chiefly to look after the sanitary condition of buildings and inmates, it was only in a secondary way that I could at all reach those questions which still more vitally concern the inmates of these institutions. I could at least have many opportunities to study some of these problems, and aid in impressing the importance of more special inquiry into the causes of pauperism and the practical modes of its limitation.

At my earlier visits to Camden county alms-house, 100 tramps were among its winter boarders. The Freeholders have wisely broken up the whole system of their reception, as have some other counties. This, however, has caused other counties, and especially some jails, to have an additional share.

Over and over again I meet cases where the weekly visits of two intelligent persons with proper powers, who had studied the subject of pauper care, would entirely change the whole morale of institutions, as well as greatly curtail their expenses. Only personal acquaintance with each inmate and some of their history can secure this. The New York State system, as well as that of some of the Eastern and Western States, has shown how feasible is such an oversight.

In many of our alms-houses there is a freedom of intercourse between the sexes, greatly to the detriment of all concerned. Before I had been in practice sixteen years I had attended in alms-house childbirth a woman thus born in the alms-house, and the child at whose birth I had been in charge—this child, in its turn, also to have similar rearing. Even the few births do not represent the more continuous degradations. I could give example after example of exposures of half-demented persons, of epileptics, and of those not so accountable as the committees in charge of them, besides cases of more deliberate sin.

It is now well recognized that a complete separation of all children except small infants is necessary in alms-houses, if we would not perpetuate pauperism. Yet in only two alms-houses of the State has such a system been adopted.

Some time since I had a personal example of how alms-houses may encourage and perpetuate pauperism, as well as of the evil effects upon children. On my way to visit one of our largest county alms-houses, while waiting at a station, my attention was attracted to a plainly-dressed woman in charge of six children, the oldest being about thirteen years of age. It was in the late fall of the year, and taking her for some emigrant about to join her husband in the far West, I offered my services to aid her in getting the family on the train. I then inquired whither she was journeying. The reply was, "To the county alms-house, sir." She told me that her husband was a stevedore, and that, being unable to get work now, he had gone away, and they were thus seeking care.

When we arrived near the alms-house and the older children had alighted, I soon found their familiarity with the place, where they had companions of all grades and ages. It then transpired that it was the habit of the father each fall to disappear from the family, and for all to be transferred to public support. It was evident that the older children were already demoralized by the system and by their promiscuous association. Here was a training system and a training school for dependency and crime—a system sure to secure an increase of ignoble and culpable pauperism from generation to generation. Is it not high time that we stopped forming such iniquity by our laws or modes of conducting such institutions? I have not, in my experience, been half so much impressed by what are generally called the abuses of public institutions as by their wholesale systems of organized injuriousness, by which our alms-houses are oftener the promoters and originators of culpable penury than they are the timely refuge stations of honorable poverty.

Our modes of management and supervision are accountable for the former, and greatly interfere with the chief and grand design of provision for the afflicted and unfortunate poor. While the town or county committee should be in charge of all financial matters, and the body to whom all recommendations should be made, there is occasion that each year some sanitary authority should report the structural and regulative needs of the institution, and another committee give opinions as to what is feasible in respect of each inmate.

The defect is in our general alms-house systems, rather than in any special abuses. We can claim that most of the alms-houses are well kept, in the ordinary acceptation of the term, and would not be criticised by the ordinary visitor, who is only looking for a place where persons have food and clothing enough and a fairly-good bed to sleep upon. But we say that could the improved system of management, inquiry and care be applied in this State, there is scarcely an alms-house in which expenses would not be lessened at least one-third in the next three years, and, in many cases, an amelioration of personal conditions be secured of far greater importance.

The chief modifications would be these:

1. The State Board of Health would be enabled to give such attention to these institutions as that it could make an expert report to the managers each year of all defects in structure and sanitary management, and indicate necessary alterations or improvements.

2. Each township or county or city having an alms-house would have a home committee of two or three ladies, appointed by the State Charities' Aid Association, who, having made themselves familiar with the best views as to alms-houses and their inmates, would see to it that all regulations as to separation, bathing, clothing, occupation, discharge, &c., were carried out, and would, after personal familiarity with the case of each inmate, recommend to the home officers or committee the wisest course to be pursued. We know of a case in which such an investigation as to a single family sent to an alms-house saved a township more than five thousand dollars. I have, by letters from inmates and by my own casual visits, sometimes obtained information as to individuals of much value in guiding as to future management.

3. Provision would be made by which, except under the rarest conditions, children would not be brought up in alms-houses.

There would result a knowledge of the causes of dependency and of the relation of unaided poverty to the pauper element which would be of great service in conserving the best welfare of our productive classes. We append some statements as to alms-houses more recently visited, which might be greatly extended if our care embraced the entire range of inquiry.

I.

ALMS-HOUSES.

The following is a list of the county alms-houses, including the counties in which not all the townships are represented:

Atlantic county alms-house, at Smith's Landing, near Pleasantville, represents seven townships. Bergen county, Oradell, represents ten townships; another, in Englewood township, represents three townships; the two represent the whole county. Burlington county, Pemberton. Camden county, Blackwood. Cape May county, Cape May Court House. Cumberland county, Bridgeton (two miles distant). Gloucester county, Clarksboro. Hudson county, Snake Hill. Monmouth county, Asbury Park (three miles); represents four townships in Monmouth county, and two (Brick and Dover) in Ocean county; another, in Raritan township, represents three townships. Morris county, Boonton (three miles). Salem county, Woodstown (two miles). Sussex county, Branchville. Warren county, Townsbury.

Some of the counties have not county houses, because their large cities have city alms-houses, some of which also receive a few from townships. The following are the chief city alms-houses in counties having no county alms-house:

Essex county, city alms-house, on outskirts of Newark. Mercer county, city alms-house, on outskirts of Trenton. Middlesex county, city alms-house, New Brunswick, two miles from city. Passaic county, city alms-houses, Paterson and Passaic. Union county, city alms-houses, Elizabeth and Rahway.

In other cases the poor are cared for in township houses, or, where there is no house, by boarding out. In Hunterdon county but one township (Raritan) owns an alms-house. In Monmouth county Raritan, Holmdel and Matawan townships have their poor together in an alms-house in Raritan township.

There are eight county asylums, in all cases connected with the alms-house property, except that of Essex county. Those of Camden and Hudson counties are under somewhat separate management. We append, as examples, a few of the alms-houses recently visited.

ATLANTIC COUNTY ALMS-HOUSE.

Smith's Landing.

Atlantic county alms-house. Visited April 20th, 1888. Located at Smith's Landing. Steward, Joseph B. Turner. Physician, Dr. Somers. Large house and sixty acres of land. Number of inmates, eight men, eleven women, no children; three nearly bedridden; one deaf and dumb; three defective. No special inquiry as to vaccination of adults. Bedsteads wood, and much of the furniture unfit. Underclothing furnished, but not much outside clothing. In some cases the garments worn were too greasy and old for use, and help to make the house uncleanly. No bath-tub in the house. No indoor closet arrangements. No disinfectants have been kept on hand. Outside closets well cared for. No cesspool, but slop and laundry-water runs through open drain out on surface a distance from the house. The wooden drain, and the continuous use of the same one for years, objectionable. Well kept. Water from a good well. Each room should have weekly inspection. As the house is large, every person should have a separate room.

There is a separate part for men and women, with separate stairs, but they have a common sitting-room down stairs, which is too crowded. Should be a sitting-room on second floor for women for sewing, and for being together.

The furnace in cellar does not sufficiently heat the building. While it may suffice for those in bed, the two sitting-rooms each need a stove or other fire. There is a good fire-escape. There are no religious services, and the inmates are seldom visited. Records have been imperfectly kept. A new Steward had just moved in, and seems likely to conduct a thorough administration and oversight. The alms-house would accommodate about sixty. No outdoor help.

Pauperism is diminishing in the county; especially attributed to the anti-saloon sentiment.

REMARKS.—The chief need of the institution, in a structural way, is two bath-tubs for men and women, so located as to secure warm water. Various suggestions as to administration were made to the Steward, whom it is believed will make important changes in the system of care and inspection.

CAMDEN COUNTY ALMS-HOUSE.

One and one-half miles from Blackwood.

Camden county alms-house. Visited April 25th, 1888. Steward, C. F. Adams. Physician, Dr. Brennan. Ground, 146 acres. Buildings, brick—described heretofore. Basement for storage. Bedsteads mostly of iron. Sewers of vitrified pipe and ventilated outside of house; several indoor water-closets—some hoppers; one or two out of order; all inside waste discharged into sewer. Water-supply from Spring Mill brook, carried to top of building; stored in tank. Heating by steam—low pressure; radiators good except that ventilation needs to be carefully looked after, as the system of heating supplies no pure air. A few feeble-minded persons in alms-house. (There is outside help by townships and wards, but not by the county.) Proper separation of sexes. Some of the children have been taken to Children's Home at Camden. House in general good condition. Separate building for hospital; not kept as it should be for a hospital; made too much of a convenience of; bath-tubs are in the hospital; idea of hospital must be more fully carried out; should not be a place for anything else.

Number of inmates, sixty-nine men; forty-one women, including children; twelve grown colored persons, three colored children; twelve white children under ten; most of them infants. Number of births, ten—two of house maternity. Deaths, sixteen. Children all vaccinated. Bathing is required of all persons every two weeks.

REMARKS.—This alms-house has been greatly improved the last few years, and so far as structural arrangement and sanitary care are concerned is among the best.

Asylum on same grounds as alms-house, but different officers, except the physician. Had when visited 106 inmates—forty-four men, sixty-two women. Attendants—matron, two men and four women. There is no classification, except that epileptics are kept separate. Thirty-three patients admitted since May 1st, 1887. Several colored patients.

REMARKS.—Some of the same defects found in most county asylums as to skilled care. The basement-rooms should have plank bedsteads for those who will not use ordinary beds. The water-closets should have better flush. The sewer should not run to or through outhouse.

CAPE MAY COUNTY ALMS-HOUSE.

Cape May county alms-house. Visited April 19th, 1888. Steward, Eli Sayre. Physician, John H. Hand. Location, about one and a half miles from court-house. High and good location. Sixty acres farm land—200 in all. Soil, loam and gravel. The buildings are of wood and very old, and have been added to from time to time. Walls, whitewashed. House very cleanly and well kept. Many small rooms and winding stairs. No bath-tubs, but keeper particular to have none received until after full ablution. Dish and laundry-water goes on the ground away from buildings. No indoor closet arrangements. Outdoor arrangements above ground and cleansed. No cesspool. Disinfectants are kept on hand—chloride of lime and sulphate of iron. Water from wells. Catch rain-water for washing. Fifteen now in house. Average last year, twenty to twenty-five. About equally divided as to sexes. At present three feeble-minded women. Inmates well fed. Number of poor diminishing with decrease of liquor traffic. There is some outdoor relief—fifty cents a week allowed. Cost per year for out-of-door relief, about $200. No children born in house of late years. Two children there and sent to school. Five have died the past year, and ten in two years, mostly old inmates. Moral condition well looked after. Funeral services at every death.

The Freeholders are now preparing to build an entirely new alms-house. Had a conference with the architect. Suggested several alterations in plan, but fear the new building will be planned after an imperfect one seen by the committee, and that it will not have some valuable and inexpensive additions.

Remarks.—The alms-house has been well managed, considering many disadvantages in construction. Several years ago it was far more *patronized* than now. Children were not sent to the district school, but injured by being taught at the house. A great improvement was manifest as they came to mingle with others. It is very important in such institutions that the wife of the Steward be a house-keeper who has personal supervision of the rooms and the inmates, and that the keeper have patience, diligence and an orderly method of oversight. We see some great defects of management even where buildings are good, but here good oversight, by both the Steward and his wife, has made up for many structural defects.

CUMBERLAND COUNTY ALMS-HOUSE.

A report to the effect that there were an unusual number of deaths occurring, called for an investigation of the facts. The house was found in very good condition, and upon examination of the death certificates no one of the cases could be found which would indicate any bad sanitary condition as the cause of death. Most of the deaths were from old age, and it was only circumstantial that so many had occurred in so short a time. The institution is kept very cleanly and the results of good housekeeping are plainly visible. The chief objections in construction are—1st. Entire lack of provision for the ventilation of most of the apartments, except by windows, which the inmates insist on keeping closed. 2d. No provision for care of wash-water and kitchen waste, except by an open brick drain; this is kept carefully flushed by the Superintendent, but has objectionable features. We have had letters of complaint from inmates.

The asylum connected with the alms-house is in good order, and at the time of the visit contained but five inmates. The outbuildings were in good condition.

GLOUCESTER COUNTY ALMS-HOUSE.

Harrisonville, one mile from Clarksboro.

Gloucester county alms-house. Visited April 24th. Steward, George G. Weatherby, Clarksboro, Gloucester county. Physician, Dr. Staiger, Harrisonville. Ground, high and improved. Building, brick. Walls, whitewashed. Windows, high. Children not vaccinated, but to be attended to this week. Spring and fall house-cleaning, and good weekly care by Steward's wife. Clothing furnished if absolutely needed. Six bath-tubs. Bathing not enforced. Laundry work in wash-house. Basement used for dining-rooms, &c. All slop-water goes into cesspool. The laundry has a separate drain. Cesspool has three outside privies over it—a bad arrangement.

Water-supply—a spring, which feeds reservoir. Pump also used for drinking-water. Have cistern, but don't use it. Ventilation by windows only. Water-closets very good, paragon hopper. Six closets, all in good condition. Heating, by furnace. No fire-places in bed-rooms. Separate sitting-room for men and women, but relation of rooms and entry-ways in basement unfavorable to proper separation. Inmates at present, thirty-two men, twenty women, seven children. In winter more. Five births within one year; two of patients who came within a few months. Ten deaths. There is also outside help by Overseer of the Poor. Inmates well fed.

Asylum, six inmates, all but one able to be around.

REMARKS.—The alms-house is well superintended, and the building for the most part suitable. The basement should be abandoned for present uses, or if not, a much more distinct separation made between sexes. The number of children born here is noticeable. The construction and location of basement-rooms do not admit of proper oversight. The bath-tub and closet arrangements are among the best in the State. House slops should never run into a vault or pit over which outbuildings are located.

MONMOUTH COUNTY ALMS-HOUSE.

Although Ocean county was set off from Monmouth, no division of the alms-house was made. It is owned jointly by Atlantic, Brick, Dover, Howell, Middletown and Wall townships. Three annual examinations of it have been made by Messrs. Hunt, Osborn and Health Inspector Mitchell. That of Dr. Mitchell being the last, we subjoin his report.

The house has been described in a previous report. No provision has been made for ventilation except that afforded by doors and windows, and in cool weather these are kept tightly closed, they being under the control of the inmates, and not being regulated by the keeper. The air in the building suggests the odor from floors recently scrubbed with dirty water. The floors are uncovered, and their wide cracks contain the accumulations of three-quarters of a century. The open crevices in the floor permit the dust and dirt which is loosened and moved during sweeping and scrubbing to fall through upon the ceiling below, and from these sources the offensive odor which pervades the building appears to proceed. Wood-stoves are placed in several of the rooms, and they doubtless afford sufficient heat. In the basement are three rooms and a hall. One of these rooms is used as a sleeping-room by one of the inmates of the house. This room is 18 x 18 x 7. It has one door and two small windows. The floor rests upon the ground, and the wood is decayed in places. The air of this room is vile, and although I found the door and windows open, yet the musty, damp, rotten-wood odor was unendurable. I was told by the keeper that the occupant of this room is suffering from incontinence of urine, and he is kept there because he makes a nuisance if allowed to occupy a room near other persons. There are several unoccupied rooms on the second floor of the house, and there is no good reason why this man, if he is decently attended, should not occupy one of these. Indeed, if he was cared for properly, he could occupy a room with other persons without creating offense. The room in which he now sleeps is unfit for human habitation.

The privies, two in number, are situated about seventy-five feet from the dwelling. They have no vaults, but the excreta fall upon the surface of the ground beneath the privy building. They were found with large accumulations beneath the buildings, and water was standing about and beneath one of them. The custom appears to be to throw earth over the excrement occasionally, and to remove the mass in course of time, but the business is neglected, and odors proceeding from these places were abominable. In their present condition and location they constitute a nuisance.

Northwest from the dwelling, and distant from it 210 feet, is a hog-pen 100 feet square. In this pen were about a dozen large hogs. The odors from this pen were as bad as hog-pen odors average. Between the privies on the east, and the hog-pen on the northwest, the dwelling receives odors which, in some seasons of the year and in certain conditions of the atmosphere, must be exceedingly disagreeable, and, in my judgment, dangerous to health.

The water-supply is from a well near the kitchen door. Its surroundings lead me to suspect the purity of the water. I have obtained a sample of the water for analysis.

The number of pauper inmates at present in the institution is twenty-nine. No serious sickness has occurred during the past year. J. Newman is keeper.

SUGGESTIONS.—1. All wooden floors should be removed from the building. The basement floor should be covered with coal-tar concrete four inches thick. All spaces above ceilings should be made clean, disinfected and deodorized. The floors of first and second stories should be relaid with narrow boards.

2. The windows should be kept open, except in extremely cold weather. The keeper should control the ventilation and adjust it to changes in weather.

3. No person should be permitted to sleep in the basement.

4. The privy nuisance should be abated.

5. The hog-pen should be removed to a point at least 1,000 feet from the dwelling.

II.

OUR PRISONS AND JAILS.

It is fortunate that there is no longer so much reason as formerly to argue the importance of giving careful attention to all questions relating to the management of penal institutions. Long ago it was regarded as important to secure safe places of confinement and to prevent such insanitary conditions as would breed pestilence. Some attention was also given to the item of expense.

Now, it is recognized by all intelligent citizens, who have at all thought upon the subject, with the facts before them, that the most of those committed to prisons and jails are there only for temporary confinement. The average of committals to jails, is, we think, from statistics before us, not over from one year to eighteen months. Our penitentiaries do not receive those committed for more than eighteen months, while, in going over the prison list, one is struck by the fact that most average less than two years.

The thousands of the riskful class thus represented, are therefore, for the most of their lives, a part of society, mingling in the daily life of the people. As such, even from policy considerations, they are a class to which the State and the municipality must in their own interest give the most serious and wise attention. In order to do this, there must be experience in dealing with all grades of prisoners or familiarity with the opinions of those who have had such experiences. There was a time when most thought that a convicted person was taken in charge by the State only for punishment. We are wiser than that now, in judgment, but not always in practice. Penology, or the study of the prisoner, has become a great department of political economy. It has to do with the welfare of society, with the safety of the State, as well as with its finances and morals. We have to deal with the culprit, not only in view of the duty we owe to him, but the duty we owe to the State. That includes far more than punishment. It must include, in most cases, an effort to send him forth from the jail or the prison walls with a will, an effort and a capability to be a better citizen. If we diminish his taste for crime we do something that is good policy. If we even diminish the number and degree of his offenses, there is some gain. If he cease to belong to the criminal class, we do more. If we make of him a productive citizen, we do far more. If we, in one case in a hundred or a thousand, arouse true manliness, and make of him a noble, saved man, a grand climax is reached—one not to be expected except in a small minority of cases. Even that is worth striving for. In attempting it, we strew all along the pathway of society other great and compensating benefits, and do service for God and for humanity.

This is all the more important because so large a proportion are from the young. Mr. Wines, Superintendent of the Illinois Charities, recently states that of the 58,000 persons in prisons in the United States, over one-third are under twenty-five years of age. One-half of all arrests are under the same age. This gives more hopefulness on the one hand, and on the other, if there is not reform or method to prevent repetition of crime, secures us a great aggregate of years to tell against the welfare of society.

We, therefore, now ought to attempt three things with the convicted wrong-doer. First, to punish him; second, to prevent him from being a source of crime by his influence on others; third, to reform him.

As to the first, some great light has broken in. We have learned that there is a science and art and experience as to punishment quite different from the ancient modes of torture. No longer is it advised so to keep prisoners as to undermine their health. That is often practiced, but when brought to light is called *cruelty*, although it is a punishment. No longer do we keep the *long-term* prisoner in sullen silence, for although work is less tedious and less of a punishment to most, it is found that in long-term prisoners the ends of punishment can be best met without enforced idleness.

It has also been found that in order to make punishment more rigorous and deterrent, it is often better not to limit the term of imprisonment only by the name of the crime, but to let the number of committals also aid to determine the length of imprisonment.

For instance, the plan of permanently confining incorrigible criminals has for some time been adopted by the State of Ohio, where it is said to have worked admirably. Under a law of that State, passed by the Legislature last winter, after a criminal has been twice convicted and imprisoned he is regarded as an habitual offender, and is confined for life, except that after a stipulated term the Board of Managers of the prison have the discretion of allowing him to go outside the enclosure on parole, though he still remains in legal custody and is always liable to be taken back summarily. In other words, the incorrigible or professional criminal is treated as if he were a lunatic, and only permitted to go abroad after long and apparently successful treatment, with the certainty of an immediate return to confinement if he shows his unfitness for freedom.

This method, approved and recommended by the penologists lately in session, has common sense on its side; it ought to prevail in this State. "Now, after capturing old criminals at great expense we send them to prison, a burden upon the State; and after a few years release them, allowing them all the privileges of the honest citizen—except the single right of voting—with renewed opportunity for assailing the peace and welfare of society. This is not only a stupid but a very unjust way of dealing with crime—unjust to the hardened criminal, who needs to be kept from further crime, and unjust to society, which is again in jeopardy of his deeds of violence. The only true way is to capture these incorrigibles and hold them fast so that they can no longer prey upon society, or society be again subject to their lawless violence.

"We kill mad dogs and destroy or securely confine all vicious animals except man; he alone is allowed to shoot and steal, to burglarize, to assault—sometimes to kill. Then when the law officers get him in their power, and the prison walls enclose him, after a few months or years the prison gates are re-opened, and clad in a brand-new suit of clothes he is given the freedom of the republic to re-inaugurate his career of crime. It is high time to change all this."

In the July number of *Harper's Magazine* (1888), Charles Dudley Warner, speaking of the penitentiary at Joliet, Illinois, writes thus:

"I am glad to see that the Warden believes that incorrigibles should be permanently held, and that grading, the discipline of labor and education, with a parole system, can make law-abiding citizens of many convicts.

"In Ohio, since the passage of the Parole act of 1885, 283 prisoners out of an average of 1,300 have been paroled. While several of the convicts have been returned for a violation of parole, nearly the whole number are reported as law-abiding citizens. The managers are exceedingly pleased with the working of the law; it promotes good conduct in the prisoner and reduces the number in confinement. The reduction of the number of convicts in 1887 to 1,300 from 1,400 in the former year, was ascribed partially to the passage of the General Sentence law in 1884, and the Habitual Crimes act in 1885. The criminals dread the first law, because it gives no fixed time to build their hopes upon, but all depends upon their previous record and good conduct in prison; while the latter affects the incorrigibles, who are careful to shun the State, after being convicted twice, and avoid imprisonment for life."

The reformatory at Elmira, N. Y., under the care of Mr. Brockaway, in ten years released 1,722 prisoners on parole or ticket-of-leave, of whom 1,125 have since been heard from. Of these, fifty-four died good citizens; 830 were living without crime at last accounts, and only 233 had got into prison again or been prosecuted.

This is no doubt a better average than is usual, but such a fact has in it enduring substance for untiring zeal and reasonable expectation of much good.

A medical writer recently speaks thus as to the prisons of Great Britain: "The prison reports have, in recent years, afforded some very pleasant reading, and, happily, the present year is no exception to this rule. The commissioners who administer the local prisons, and the directors who have the eleven large convict prisons in charge, are both able to speak of a continued diminution of the number of prisoners coming under their care, and an almost equal improvement in their conduct while under restraint. The amelioration in the condition of these the outcasts of society, is gratifying in every way. It speaks, as we hope and believe, to an elevation of the whole mass of the population, which has been sufficiently comprehensive to include even the criminal class in its operation; and it indicates also, in a manner still more unmistakable, that a large measure of success has attended the efforts which have been made in recent years to improve and perfect our prison discipline. From a sanitarian's point of view also, the results now shown by our prison management afford legitimate grounds of satisfaction."

So, both in principle and practice, indeterminate sentences, or the leaving the term of confinement at the determination of the Judge, in cases of repeated crime, have been found both punitive and corrective. Then again, the Crofton system, one of the provisions of which is abbreviation of the term of imprisonment by reason of good conduct, industry, &c., has been found not inconsistent with proper punishment. (See Miss Mary Carpenter's Outline as printed by New York Prison Association.) The element of hope, and the principle of earning a rebate, if not carried too far, do not so much alter the punitive benefit of the sentence as to work injury.

Thus far, the advocates of modification of punishment have, except from the most exacting, escaped the charge of sentiment or sentimentality.

Strange to say, those who, instead of directing their attention to shortening punishment, have advocated all the three methods before named, have often been accused of *sentimentality or sentiment.* This has arisen slightly from the fact that sentimentality does sometimes prevail among a few of those who visit prisons and jails. But it is noticeable how little of it is found among those of thought and experience who are recognized as authorities, and who really give direction to correct views. Those who lavish attention on condemned criminals, are not those who, as good citizens, have studied prison life and how to deal with it, but those who, without experience, are moved by excitement or pity.

Another reason for this incorrect view is that so many confound *sentiment* and *sentimentality. Sentiment* is not gush. It is not feeling only. It is *feeling which gives rise to thought.* It has no other definition. It is reason. The heart can prompt to reason as well as the head. He who would blot out sentiment from the management of anything human is worse than a stoic. Sentiment is the sincere movement of thought, which in its start is impelled by feeling. Sentimentality is the unreasoning, illogical outcome of unbalanced feeling, and as such is artificial and unsound. Sentiment is one of the higher powers. Sentimentality is one of the lower weaknesses.

The citizen of any degree who nowadays conceives of a prison or a jail as only a place for punishment, and frowns upon those who, moved by feeling into thought, devise methods of reaching the prisoner so that he may not corrupt others, but may be possibly reformed, is himself the victim of a sickly sentimentality. When, in 1877, Parliament regulated and unified the prison system of England on this broader basis, and when, as since, it has applied also other advanced methods, it has done it because true sentiment, real experience and wise statesmanship have conspired to recognize the principles now seeking to be applied in the management of prisoners and of all penal institutions.

By the common consent of all students of the subject and of practical workers among prisoners, the two additional objects alluded to, viz., the dealing with the prisoner so as to make him the least possible source or occasion of crime to others, and an attempt in the direction of possible reformation, are included in all intelligent schemes of prison and jail management.

How enormously the prison and the jail may become the source or occasion of greater crimes to the young, or to those who have offended in smaller matters, as well as to those outside, who are afterward exposed to their malign influence, we shall hereafter have occasion to illustrate. On the other hand, the evidence is abundant that wise and intelligent dealing with the most of prisoners can do much to lessen their influence for evil over each other and over other members of society, when they return to it, as so many do so soon.

As to actual reformation and abandonment of criminal life, the general public are and always will be suspicious and misgiving. Wise laborers in the cause of this reformation know that they have many disappointments. But surely the combined testimony of these laborers should be accepted, as they are in accord in witnessing that results, even in this direction, are sufficient to fully repay the efforts which have been made.

His Excellency Governor Green, in his recent message, has expressed very forcibly similar views. He speaks thus: "It is not punishment alone, with its salutary lesson of warning to others, that is to be accomplished by a perfectly-constituted penal system. The reformation of the criminal is not to be lost sight of in securing the safety and well-being of the community. So long as the convict is capable of improvement, he should be the object of proper means to effect his reform. There are two classes of criminals to be dealt with —those who, by proper care and treatment, may be reclaimed, and those who are incorrigible. As to the latter class, penologists are, at present, of the opinion that their term of imprisonment should be for an indefinite period, to be released only on satisfactory evidence of thorough reformation.

" As to the other class the problem is more interesting and difficult. Statistics show that the average age of the convicts in the United States is a little over twenty-six. The majority must, therefore, be mere youths. If the boy, led astray by evil associations or unchecked vice, or the man who, in some sudden passion or through unfortunate indulgence, commits serious crime, and is convicted of that which is his first offense, he will, under our present system, probably, and properly, be sent to the State Prison. He is there brought into daily contact with the hardened criminal, and on the expiration of his time goes into the world, not only with the disgrace of his imprisonment on him, but his moral system poisoned by the associations in which he has been forced to live. It will be a miracle if that youth or man ever becomes a useful member of society. Our system is behind the position of enlightened thought and experience upon this question."

It is not the design of this article to discuss the whole subject of prison and jail management. But thus much has been said in order to outline, in some degree, the importance of the subject, and what is sought to be attained.

We shall consider prisons and jails with reference to the interests of this State. While pointing out some of the good features of our system, the chief design will be to direct attention to defects, and to indicate what improvements can be made.

It may as well be said just here, that what we have to say is not at all in criticism of the faithfulness or ability of most officials. Indeed, as a rule, representations as to neglect or cruelty are the offspring of ill-founded sentimentality, or very inadequate knowledge of facts. We often find prison and jail officials ready to respond to criticisms made, and themselves more than any others, feeling the defects of the system under which they are compelled to carry on their service. We shall speak separately of the prisons and the jails.

Under prisons we include the State Prison, at Trenton, and the Penitentiaries of Essex and Hudson counties—the one located near Caldwell, and the other at Snake Hill. The three may, in general, be said to represent an average of 2,000 convicts. Of these the sentences of one-half do not exceed eighteen months, and of the other half, if we except a very few life prisoners, the average of incarceration is not over two and one-half years.

This at once presents to us the oft-forgotten fact, that the prison and the penitentiary are only very temporary places of detention, and that their inmates are, for a good part of their lives, a part of the general constituency of the State. As such, both policy and principle compel us to take a deep and well-planned interest in them.

As to our prisons in a sanitary aspect, the chief defect is want of air-space. Cells intended for one or two, come to be used for three or four, and the area of corridors is not sufficient to relieve the closeness. Foul air always has its effect on general conditions of health, besides adding to the irritability of many of those exposed to it.

There is too often defect in the medical and sanitary system. Physicians are too frequently chosen from some special consideration, and not as a result of competitive examination or peculiar fitness. Their duties become those of routine, and do not, as they always should, include a thorough knowledge of the details of sanitary inspection, and of the mode of preventing and correcting evils. Every prison needs the frequent expert visits of the physician as a sanitary inspector. Not long since, in order not to be intrusive or over-critical, we had to submit to the view that the burning of coffee every morning was a complete disinfectant. No doubt its aromatic odor is good, and it may not be objectionable if it is not used to conceal odors which would otherwise be intrusive. The work of the inspecting expert is not to admire the general order and cleanliness, but to pry into hidden corners and to inspect out-of-way places. While there is general vigilance, we are not aware that in our prisons (in which we include the penitentiaries) the physician either makes such inspection or is held accountable therefor.

Some recent English and Scotch enactments in these regards are very technical, and require of the medical officer in charge knowledge as to many details in respect of the prisoner and the place of confinement. Here is an instance:

"The Secretary of State for Scotland has just issued a new set of prison rules, in which the duties of the medical officers of Scottish prisons are, among others, very carefully and minutely set out. In the main the duties thus defined coincide with those of medical officers in English prisons, but in one or two particulars the new regulations enlarge the medical man's responsibilities. Thus, he is charged with the care not only of the prisoners, but also of the families of officers and servants of the prison. He is also made responsible for the preparation of an indefinite amount of statistical matter at the direction of the Commissioners. He is required, like his English *confrère*, to make a quarterly inspection of the prison premises, and in addition to this he is frequently to examine the 'washing-places, baths, and other provision for the purposes of cleanliness and sanitation, and see that they are in efficient working order.' The inspection of the food supplied to prisoners, both when cooked and while uncooked, is specifically prescribed to him. The regulations relating to the attendance of the sick and the weekly visitation of prisoners in good health are practically the same as those which obtain south of the Tweed, but the new Scottish regulations also direct the medical officer to examine the prisoners from time to time during their employment at labor, with a view of satisfying himself as to their fitness for the tasks imposed. He is also to be consulted in every case where it is proposed to subject a prisoner to close confinement or to dietary punishment, and his sanction is only to be given after personal examination. So far the duties of the medical officer are offices of mercy intended to mitigate the severity of punishment, and in England his whole duty may be said to be comprised in that description. In one particular, however, the medical officer of a Scottish prison is to be pressed into detective service, for it is now defined as a part of his duty to report to the Governor of the prison any mark which he may observe on the person of a prisoner capable of serving the purpose of identification. Thus it will be seen that the new regulations have been prepared by the light of past experience, and give a very detailed view of the functions of the medical officer of a prison. The tendency of the time undoubtedly is to attach increasing importance to the due discharge of these functions, and we believe it will be found that greater attention to the health and sanitary surroundings of the prison population, far from diminishing the efficiency or the effect of prison discipline, will powerfully assist those influences tending to reform the criminal, which it will be the aim of all enlightened legislation to strengthen."

Of all others, the prison physician should realize that to be a physician is not necessarily to be a sanitarian, and he should make the technical sanitary care of his institution a subject of special study, and of special application of that study.

The next great defect in prison management is in the absence of such systematized reformatory oversight of prisoners as seeks to make them less of a peril to society, and, if possible, to excite the nobler instincts of their natures toward a desire and an effort for reform.

To the general citizen a prisoner is a prisoner—a criminal. It is forgotten that numbers are imprisoned for minor crimes, that do not denote them to be hardened offenders. Young men are sometimes led into an affray, and get in other serious offenses against the law, much out of accord with their general orderly obedience to law. There was often no deliberate malintent, although criminal conduct which merits punishment. Every man or woman placed in prison should early fall under the inspection and acquaintance of some one whose business it is to look after the idea of moral restraint and improvement. Many a person in prison is placed under the most favorable opportunity that ever has occurred to him for an effort to be made for instruction and reclamation.

We have had to do with some of those skilled advisers who, from experience, have come to be as expert in this business as is any merchant in the line of his work. Such do not patronize prisoners or crime. They come to know which are the hardened and the hopeless, and often advise punishments more severe and sentences more prolonged. They also come to know the large possibilities of arousing manliness in others; of showing them the folly and the ill-policy of their action as well as its wickedness; of suggesting to them other means of livelihood; of aiding them to such knowledge and giving them such training as will fit them for honorable industry, and guard them from besetting temptations. It is true that there are not very many fitted for this discerning work; but the man or woman of heart, of sympathy, of interest in prisoners, of such mental vigor and skill as will guide the heart by wise judgment, is indispensable in the care of prisons. Our State seemed to have some conception of this when it used the name "Moral Instructor" instead of Chaplain. But however important moral instructors may be, unless they can give their whole time to this duty, and put themselves in relation to each prisoner, they cannot do this work. As a rule, it can be better done by some one selected with special reference to this special care. The keeper of the jail in Edinburgh told us that a woman who accompanied us in a visit to each cell had been in this capacity for more than thirty years, and had not only greatly aided him in discipline, but had been of most signal advantage to prisoners in the way of instruction and reform.

No one can read the yearly records of the Prison Association of New York without perceiving the great wisdom of this work; for besides the occasional radical and spiritual change brought about in some, it must be remembered that the recovered manhood or the politic abandonment of crime or the diminution of the relish therefor, means large moneys saved to the State, and a labor for the good order of society. Without it, mere imprisonment is not the sovereign means that some imagine, for the securement of obedience to law and good order. It is thoroughly feasible that such of the 2,000 convicts of this State as have a ray of hopefulness in their characters, should be reached by the State in this way. So long as they are not, it behooves patriotic, State-loving and hearty men and women to combine to accomplish, in a voluntary way, that which is entitled to be arranged for, as a part of the political wisdom of the State. It is within our knowledge that the Keeper of the State Prison, at Trenton, is in full and intelligent sympathy with these views—that he has himself done something in this direction. He well recognizes that any system of dealing with prisoners is faulty that assumes that most of those incarcerated should be looked upon as hopeless criminals. In the interests of the State, they are to be regarded as capable of improvement. We believe the same will be found true of the penitentiaries, when the attention of Governing Boards is enlisted. It is not the pietist or the cold reprover that is needed, but the man or woman who puts himself or herself in relations of confidence and sympathy with the prisoner, that has a Christian heart guided by thought and judgment—believing in punishment, yet not swayed by mere feeling on the one hand, or by inexorable justice on the other.

Akin to this need, and one properly committed to the same persons, is a systematic provision for *discharged criminals*. Phillips Brooks, of Boston, in a recent reference to the Discharged Prisoners' Aid Society, well says: "I think there is nothing in the prisoner's whole history which so appeals to us as his position when such a society seeks to look after him. In it is the sole resource of many a poor creature, standing in what we may deliberately call *the most forlorn and desperate condition which civilization has to offer to a human being*—the position of the discharged prisoner. Without such a society there would be little hope."

Yet, this State is to be pitied that no such provision is made. A prisoner who has formerly resided in New York State, when he leaves our prison has an invitation to come for aid to the Prison Association, but no such boon is offered here. One keeper has told us of cases under his own knowledge where there was apparently an honest intent of reform, and where such a society might have availed to save the outgoing man from his old associations and temptations.

If there is a proper study of cases in prison; a preparation for freedom; a planning with the man who would forsake his former life, so that he can be rid of former influences and enter on an industrial life, and if, then, there is some person or some society ready to receive and guide him, we have a method of saving, most hopeful in its results. While here we must trust to voluntary co-operation; if the State prepared the way by proper aid during prison life, we doubt not such a society would soon be formed. As it is, many a discharged prisoner can only look out upon his new liberty as upon a friendless world, and with no one to guide or aid him, he is shown the first token of sympathy and companionship by those who are quite sure to get even the pittance given him on discharge, and prepare him soon to fall amid the desperation of hunger or the hopelessness of a forsaken life.

Other considerations as to our duty to the prison population might be named, but so long as the beginnings of effort should be with these, what has been said will suffice for the present.

We now turn to consider our own jails as to structure, &c.; what they are doing as to punishment; as to preventing one from misleading or hardening another, and as to the reformation of the individual.

STRUCTURE OF JAILS.

It is well to premise that so far as structural arrangements are concerned, the twenty-one jails of the State differ very much. While it must be said of most of them that there are times of overcrowding, the jails of the smaller counties do not suffer much from this; yet some of these smaller jails are very defective in construction and in sanitary and other care. When we visited last the Sussex county jail it had but three prisoners in it, and yet it was found in a very insanitary condition, and the prisoners themselves filthy. The same has been found in other small jails. That of Cape May county, after much urging, was overhauled at moderate expense. After it was done, and the foul accumulations under the iron floor removed, no one doubted the necessity. Even where jails are roomy we now and then find two or three allowed to occupy the same cell for company's sake. So, with plenty of room, these cells are close and badly kept.

JAIL INSPECTION.

The one thing most apparent is the want of orderly inspection. We have revealed to many a keeper some nuisance existing for weeks and entirely overlooked because he had put matters in charge of some one else, and had not made his own weekly inspection into every corner and examined the closets and water arrangements to see whether they were in order. There is no substitute for this inspection. Where the evil is pointed out it is generally remedied, but will not stay remedied unless there is stated inspection also. We are always able to secure minor structural improvements, the only reason for wrong conditions generally being because no one has called attention to them.

Some jails, like that of Union county or Gloucester, are models of construction, fully equal to the best knowledge at the time they were constructed. Even in such, slight improvements are often suggested with advantage. Burlington county jail has recently been much improved, although still quite defective. The worst jail of the State, and probably in the United States, is that of Camden county, but the Freeholders have recently voted $10,000 for its improvement. It should have been forever abandoned as a jail. Here is its record for January, in the year of our Lord 1889:

There are ninety-two prisoners in the Camden county jail, with twelve cells, seven by nine feet each, to accommodate the eighty-five male prisoners. A narrow space between the north and south tiers of cells is full of tramps committed under the Vagrancy act.

There are nineteen women, black and white, of all ages and nationalities, in one room, about twenty by thirty feet, in the Camden jail.

CONSTRUCTION OF NEW JAILS.

As to the construction of new jails or important alterations, they are too apt to be arranged for on the basis of some two or three jails viewed as models by those who have had no experience in building jails or who do not know of the most recent improvements. In all cases the local authorities, having determined as to the expense, expert advice should be secured as to mode of construction. The greatest defect of all is overcrowding from inadequate room. Proper air space is not less important for good discipline than it is for the teaching of cleanliness and the preservation of the public health; for it is to be remembered that the actual sickness or number of deaths in a jail is not the measure of its unhealthfulness or of its effect on community. Many with very short sentences keep around while in the jail, and go away to be sick in alms-house or at home, or by going in their filthy condition to some insanitary locality, add to its filth and sickness, or even carry the seeds of epidemic disease.

PERSONAL CLEANLINESS.

In most of the jails there is inadequate provision for face and body washing. Most of the jails furnish no towels. The discipline of any well-managed jail should enforce cleanliness of person on all those detained long enough to deal with them. The washing of clothing is generally done in the bath-tub, and there is steam and odor therefrom through the corridors and cells. Generally, persons are allowed to wear the same outer clothing with which they come in, however soiled. It should always be fumigated, and in some cases another very inexpensive suit provided. This is always done in well-managed jails, on the ground that in the end it is a true economy.

BEDS AND BEDDING.

There is very much neglect as to the beds and bedding of jails. In many cases wide planks fastened to the wall and capable of being turned up against the wall in the day-time answer better and can be kept cleaner than any other form of bedstead. Straw, if changed very frequently, and cheap ticking that can be thrown away when not admitting of washing, answer best for the beds, together with a blanket that can be washed. The jailor, as a rule, will always tell you that cleanliness is an impossibility, but the transformations made in English jails which we have visited, and in some in the United States, show it to be so far attainable as to be a feasible educational and economical process.

FOOD AND DIET.

We purposely do not speak in detail of diet, since no starvation system is adopted in our jails; yet all our larger jails should have a regular dietary. The fact that the daily allowance for food per person varies from eleven cents to thirty-five cents per day (these two instances being in adjacent counties, where there is no need for the least variation), shows on what a loose basis the food system is conducted.

PRISONERS IN JAILS.

We now proceed to consider the jail prisoners themselves. They consist of various classes—(*a*) those committed by justices; (*b*) those awaiting trial in the higher courts; (*c*) those found guilty and sentenced to jail; (*d*) those found guilty and awaiting transfer to prison, and (*e*) those detained as witnesses.

It is with the first class that the great demoralization of our jails begins. As we come to consider the jail as a place of punishment, we find facts and the testimony of experience to be, that to the large majority *the jail is not a place of punishment.* This arises from the desultory and varied ways of commitment and the promiscuous congregating of those committed, so that very many go to jail to avail themselves of congenial society, and housing and food without any expense to themselves, and because they find it the most convenient way of spending a part of their spare time. Said an experienced Sheriff to us, "Few know the social charms of the jail to most of its inmates."

JAIL ASSEMBLIES.

It is this *congregated system that is ruining the morals, the discipline, the sanitary condition and the punitive and reformatory designs of jails,* and rendering many of them a greater menace than they are a protection to society.

It is now a settled view, with advanced thinkers and workers and with practical men in charge of jails that have adopted the system, that *all persons committed for brief periods or having occasion to wait only a brief time for trial, should have separate confinement.* It is of itself far more of a punishment as well as an aid to accomplish the other two designs, viz., the prevention of evil influence to or from others, and the affording of better opportunity for reformatory methods.

A recent English writer speaks thus: "There is a duty which society owes to them and cannot justly evade, and the treatment to which they are subjected in confinement must be directed not less to the reformation of criminals than to the repression of crime. For this purpose separate confinement is the most powerful engine which society possesses. It does what nothing else can possibly effect in the way of preventing that intercommunication by which the corrupting influence of the most vicious among convicts is brought to bear upon those of less deteriorated character, and it renders the prisoner more accessible to the improving influence of the schoolmaster and the chaplain. Thus is the efficiency of prison discipline improved and its cost proportionately diminished, since the risk is lessened that any particular convict will descend to the rank of the habitual criminal, and the end aimed at by the punishment becomes attainable in a shorter time."

REMEDY.

The first step toward this must be made by relieving the jails of commitments for vagrancy, drunkenness and such other offenses as are naturally classed as minor. We have over and over again seen the effect of this demoralization which the Sheriff, Warden or assistants are powerless to prevent. Here is a jail with sixty cells and corridors to correspond. The corridors were not provided originally for congregation, but for light and ventilation to the cells and for such silent and orderly exercise as may be deemed necessary, by marching and countermarching in the presence and under the direction of the keeper. These sixty cells are in fair proportion to the average needs of the county for all the more serious offenses. But fall and winter come. Three or four or ten tramps are arriving in the villages or in the county town each day. They are vagrants. Some of them get drunk and are disorderly. In addition, some well-known drinkers indulge too much and may get into a brawl in which no one is seriously hurt. There is pecuniary motive on the part of the constable, the justice and even others to have them arrested. One officer gets twenty-five cents and another fifty, and the keeper of the jail is allowed from twenty-five to thirty-five cents a day for keeping him. These are the kind of commitments that pay. A vagrant brought in at ten o'clock at night on Monday and discharged at ten o'clock in the morning on Wednesday counts three days. Often he has eaten nothing. In one county an incensed Freeholder offered $3,500 for the privilege of being Warden—at least, such is the newspaper statement. Vagrants, and all these minor offenders, need attention, and often need arrest, but they do not need the bars of a jail, or such jails as they are sent to. They belong in the station-house or in a work-house, or, if sent to jail, it should not be for companionship, but for punishment. This past year, in the spring, when the farmers had begun work, I visited the jail of Burlington county. Besides others in other parts of the jail, I found in one large room in the basement forty-three committed persons. I asked all of those who had been born in New Jersey to raise their hands. Two white men and one colored man claimed birth in New Jersey. Others hailed from various States or foreign countries. It was evident that most of them had not resided long in New Jersey outside of jails. The customs of our counties differ. On my first visit to Camden alms-house it was keeping for the winter over 100 tramps. Typhus fever broke out, and the Freeholders broke up permanently the plan of housing tramps in the alms-house. The next-best shift was to get drunk, to be disorderly, or to commit some small theft and get committed to a county jail. Tramps often adopt this as a settled plan. Tramps that have not been in jail are scarce.

As to all of our jails, there should be some uniformity of inquiry and method. A vigorous system, a refusal to receive to overcrowding, separate confinement and a plan of work, would lead the majority to seek quarters outside of the State, and so largely reduce county expenses. We see no possibility of building jails large enough for proper keeping so long as they are liable to the unnatural overflow of vagrancy and minor disorderly conduct. By the present system there is every inducement in many of our counties to arrest and detain for very minor offenses, since this increases the incomes of various officers. On the other hand, those arrested gladly aid in the arrest, and if the commitment is not long enough, repeat the occasion consecutively, so as not to lose their housing and food and congenial society. But alter the jail into a place of separate confinement and much of this would soon cease. We know of one Sheriff who voluntarily made the separation, putting tramps and those charged with very light offenses in a separate building. He had to allow these to be together, but by this means preserved the discipline—improved the care of those sentenced or of those awaiting trial in the higher courts.

Counties should not have to bear that portion of the expense for city vagrancy and disorder which belongs to the municipality. As it is now, the station-house keeps them but for a night, and the jail or the alms-house is made the more permanent resort.

We speak after careful observation when we say that there are at least five counties in the State in which the expenses of keeping jails and of the trial of offenses would be lessened one-half if the assembly system of keeping prisoners was broken up.

It is not only that this system goes far to mitigate the punishment. Young persons, and even children, who have been led into petty crime, are brought under influences which tend to identify them with the criminal classes. We have witnessed the contrast. We have seen, in the one case, a young man in brief solitary confinement, brought under the best influence of sympathy and control, so that he could leave his cell ashamed of his fall, without demoralization from others; with his manliness aroused; with his self-respect returned, and having received such instruction, advice and aid as would lead him into proper conduct. On the other hand, we have talked with the child, arrested in winter for stealing an armful of wood, who, for days, had been subjected to the vilest influence, and who, even while showing his shame and sorrow to us, has to submit to the jeers and jibes of old culprits in the jail. Do not our manhood and our statehood revolt against such mode of dealing with such a constituency? Recently I got a Freeholder of a county to go with me through one of our most crowded jails, and pointed out to him the defects and a more excellent way. He was reticent, but evidently felt that he ought to have known more of the condition of affairs. On leaving me he simply said, "If this July day the jail doors were opened and all ordinary prisoners allowed to go, I believe less harm would be done to society than is now being done by the present system of detention here."

The jail marks the nearest approach we have to the beginning of vice where it comes under civil restraint. If only it were a place where real punishment could be felt; a place where the arrested one was preserved with astute care from further demoralization, and a place where the prudent man or matron could seek to aid in reformation, we should have different results in jail life from those now deplored.

But how is any or all of this to be accomplished?

I. By a sedulous and organized effort, on the part of good citizens, to inform all as to the facts, and to make a correct popular opinion.

II. By such intelligent supervision as avoids captious fault-finding, but prompts to and aids in all possible improvements, at the same time making the best of defective systems as we find them.

III. Such legislative enactment as will prevent the overcrowding of jails and as will compel the due separation of jail prisoners into classes and *separateness* of confinement for at least the first three months, and for most of the other time where sentences are less than twelve months.

IV. By vigorous work on the part of the State Charities' Aid Association and its auxiliaries in securing such local expert oversight as is now authorized by law, with a State allowance to the association for actual expenses as fostering voluntary aid.

V. The continued work of the State Board of Health in looking after structural and administrative sanitary requirements, both as relating to buildings and to individuals.

The Secretary of this Board has for over ten years had occasion to visit the charitable and penal institutions of the State. With this, as only one amid manifold other duties, it has been impossible to give to them the tithe of the attention which their importance and their needs demand. As the duty had special reference to sanitary conditions, it was only incidentally that it became necessary to inquire into individual cases, and to discover defects which relate to correction and reform. With an interest in this care of the dependent and penal classes, and with a recognition of its important bearing on State interests, he has not been a thoughtless observer. It has also been his privilege to visit English, Scotch and Irish institutions, and to consult with those of large experience, both in this country and abroad, as to what is feasible and what is public interest in the prevention and care of pauperism, and of the various grades of criminals. It is not, therefore, presumptive that I claim to have a zeal somewhat according to knowledge. It can no longer be called only the work of the Christian philanthropist. While all such work must have its basis in the principles and practices of Christianity, in conscience, in sympathy, governed by prudent and intelligent thought, yet it is so much a *citizen's* question, a patriot's question, a financial question, and a question that belongs to all real manhood and womanhood, that we plead for it attention and earnest provision, with all the earnestness with which we plead for the dearest interests of individuals and of all society. The ordinary citizen has not been aroused only because he does not know the needs. The Managers, Directors, Freeholders and Committees of alms-houses or jails are often as ignorant of the real needs and the great possibilities as any others, because they only give official attention. Faithful, it may be, as to all financial and political aspects of their office, and in correcting the most obtrusive and pronounced evils, they have neither time nor a sense of the need to study the details which have to do with more permanent reclamation and with the diminution of these evils. Yet, when real defects and the possibilities of a different dealing with inmates have been pointed out, and their results in other institutions cited, we have generally found some ready to admit the faulty character of present methods, and the importance of State direction, and of organized plans for the diminution of the alarming and increasing number of the dependent and criminal population.

We, therefore, appeal to citizens in their respective localities to inform themselves and to interest themselves in this great and pressing need, to voluntary societies to organize, or if already organized, to work on with prudent and enlarged methods for reaching these classes and for educating public opinion; to the varied branches of our State government for such legislative, judicial and executive provision as shall add wise statesmanship, to the individual or combined effort of the people. We have talked with Governors, with Judges, with legislators, who are earnest in feeling that something needs to be done. We now beg for that activity which results from insight, and for that systematized provision which will prevent institutions meant to care for pauperism or crime from becoming their allies and the very cause of that which they are designed to limit. Thus, by distinguishing between that alms-giving which relieves, and that which causes dependency, as also between that correction which punishes and seeks to reform, and that other kind which converts punishment into degraded social assembly, into opportunities for educating the recent transgressor into hardened crime, and which precludes any intelligent effort at reform, we shall help to stem the current of increasing demoralization. In thus dealing wisely with our unfortunate or hazardous classes, we conserve the highest social and economic interests of all citizens and of the State. It is for our common safety and security, the demand of patriotism, no less than of humanity, and of sound morality.

SOME OF THE JAILS VISITED.

We append, as examples, a notice of a few of the jails more recently visited.

ATLANTIC COUNTY JAIL.

Mays Landing.

Visited April 19th, 1888. In charge of Sheriff S. E. Johnson and of his assistant, F. R. Moore. Sheriff resides in the building. Buildings are owned by the county. The grounds around are ample, and contain other county buildings. Jail is built of stone. Length of two corridors, fifty-five feet; width, six and one-half feet. Four windows each side. Cells on first floor, one side; on second floor, the other side. Ten cells. Cells, eight by ten; ceilings, eight feet. Unlike most jails, it is fullest in summer, on account of commitments from Atlantic City. Sometimes four in a cell, but generally only two. Cells in good order. Ventilated through corridor. Heater in cellar, but not enough to heat jail well in cold weather. Found in jail one man and two women. The two women were allowed to occupy the same cell Clothing is provided when necessary. Towels provided. Laundry work is done outside, which helps much to keep the jail cleanly. Those in jail are fed in the corridors. There are no bath-tubs or facilities for bathing. Two water-closets; pan variety and very poor. The sewage from jail is carried to an outside cemented cesspool, which is emptied as occasion requires. The frequent empyting is a nuisance. Slop-water and pump-water from kitchen should not go to it, and it should be emptied at night. The sewer is not ventilated between jail and cesspool. There is no trap on pipe leading from kitchen to cesspool. The jail could be put in good order at little expense. The present closets should be replaced by two automatic hopper washout-closets, and one or two bath-tubs provided, with hot and cold water. One would do, as where there are so few prisoners, they could be locked in cells when desired, and use the bath-room in turn. There is a good water-supply, both by cisterns in attic and by pumping up thereto when needed. Cisterns have been cleansed.

Roof, cedar shingles, painted. Jail much improved since my last visit. No fire-escape, and none needed, No lights allowed. One witness detained one month. Kept separate, and allowed fifty cents per day during detention. Fifty-seven prisoners in all, the last year. Only one re-commitment. Two-thirds are small-offense cases, or justice cases, and not court cases. Sentences from three days to six months. Tramps are not sent to alms-house, but committed as vagrants. Have had five persons under age here the last year; one, a court case—boy, aged twelve years; here six weeks, and sent to Reform School. One, a girl, aged thirteen, committed as a vagrant and kept sixty days. One, a bad boy, deaf and dumb, aged eleven years; here from June 15th, to December 13th, and then sent to asylum by order of the Judge. One, aged seven years; sent by justice as a vagrant, for thirty days; taken to Reform School, but sent back from there because under age, then let go. Next, a girl aged fourteen (colored), committed for ten days. One case of holding for support of child; the property not being enough, held the body. Freeholders may discharge. Tramps not received unless committed as vagrants. At Atlantic City, if they find vagrants, they take them away under the Draw-Bridge act, beyond city limits, and warn them not to come back. The committals as distributed for the year were as follows: May 3d, June 7th, July 11th, August 9th, September 6th, October 4th, November 6th, December 5th; 1888, January 1st, February 2d, March, none, April 3d. Not much visiting of prisoners for their instructiou or reformation. Newspapers allowed.

REMARKS.—Have reason to believe that the structural defects will be corrected. There is much food for reflection in facts here given as to those held, and as to modes of dealing with vagrants.

BURLINGTON COUNTY JAIL.

Mount Holly.

April 10th, visited Burlington county jail. Sheriff, Geo. F. Harbert. Assistant, Thomas Taylor. Turnkey, Thomas Harbert. Location, Mount Holly; well located on high ground and dry soil. The buildings are of stone and were built about A. D. 1800. The walls are plastered against the stone, and the floor is brick and often damp. Formerly the jail had no beds, but now iron bedsteads are in most of the cells. There is a bath-tub in each ward or corridor. The laundry work is done by each prisoner for himself. In the basement, where there are no bath-tubs, the prisoners have large pots in which they heat water for washing clothes. Inmates march out to get their food twice per day, and then eat in their cells.

There are three stories of cells, as follows: Basement has only four cells, and then a large room with fire-place and fire. The basement is kept for non-court prisoners put there on justices' commitments, such as tramps, vagrants, drunkards, &c. The first floor has eight cells and the second floor eight cells. The other wing has also cells, and now the jailor has vacated his apartments, and there will be a fitting up of these, so that about ten more cells will be added.

Another visit was made August 27th, and improvements were nearly completed. The general size of cells is eight by eight feet, ceiling being seven feet and then semi-circular. The number put in them depends on number in jail. The average number in the jail is about fifty-five, and for the three months of winter from 125 to 150. They have two meals, and the expense of maintenance allowed Sheriff is twenty cents per day. The average of court prisoners is about twenty. At least two-thirds are small-crime or vagrant prisoners. All tramps come here. If a vagrant or drunken man is found on the streets he is taken to a justice and committed to jail for from five to ninety days. They are never sent to the Overseer of the Poor. Court prisoners can be kept here six months after sentence.

The water-supply is sufficient, being from the public water-supply, except that in the upper part of building there is often deficient head of water.

The water-closets are of two kinds—one that flush themselves in the use and are in the cells; others that flush only by turning of a faucet. The latter are to be condemned. There are three water-closets on each floor. All the inside sewer-pipes connect with a drain sewer that runs direct to Rancocas creek. There are two outside closets in yard that are emptied as occasion requires. The building has no fire-escapes. The dietary is sufficiently good—bread, coffee and syrup in morning, and various forms of soup and meat and vegetables for second meal. Where work is done a third meal is allowed. Once carried on stone-breaking, but at much loss. Male and female jails are entirely separate. Average of females not over ten—one was detained as a witness. There were no children in the jail.

Tobacco is not furnished. Lighting is by gas in part. No lights are allowed in the jail. Clothing is issued as required—as it seems to us, properly and with good judgment. It is inexpensive and promotes cleanliness. Towels are not furnished as they should be. They can be of coarse muslin and cost little. The heating is by furnaces, and in the basement by a large fire-place and fire, which aid much in ventilating the basement. Depend on window ventilation.

The disinfectant used is chiefly carbolate of lime. This is a manufactured article and could wisely be replaced by well-known simple disinfectants.

There is preaching each Sabbath and visitation by women with books, tracts and papers.

Remarks.—This jail has been improved much in its management, but still needs some changes in its structure which would not be expensive. There should be iron bedsteads throughout. All the faucet-closets should be replaced by a few self-acting. The bath-rooms should be made better, so as to secure greater cleanliness. The Sheriff and his assistants seem to us to have reasonable views as to what is needed and within the bounds of a proper economy. In the addition made of new cells, there should be skilled oversight of the alterations.

The ventilation of the jail is much better than that of most of the older jails. The value of the large fire-place in the basement is great in this respect. There should be some new stalls or cells, made small enough to secure separate confinement for all short-term prisoners. The Sheriff now separates between court prisoners and others, and does wisely in this. But the others, which make up the bulk of the jail population, have too much of a social gathering every day. If all these could be separated it would diminish attendance more than any other plan, and the profit would more than pay for the cost of fitting up. A man could safely offer to pay for all the expense of alterations for separate confinement for justices' commitments if he could be allowed for five years the expense that would be saved to the county.

CAMDEN JAIL.

This institution was visited March 10th, 1888, for the purpose of ascertaining whether any improvement had taken place. All the unsanitary conditions which had prevailed were still existing, *i. e.* overcrowding; lack of sunlight; lack of ventilation; lack of proper bathing facilities; no towels provided for the prisoners, &c. In fact, the location, construction and management of this institution can only be totally condemned.

The Secretary again visited the jail April 25th, and found no improvement in its condition. The most vigorous effort has been made the past year to secure action on the part of the Freeholders, since the jail was not only a disgrace to our common civilization, but a menace to the health of the people. Its dark cells; its crowded corridors; its imperfect closets; its laundry work in the corridors; its defective light and air; the accumulation of decaying garbage; the filthy beds, and the dirty crowd of the most pitiable mass of humanity that can be imagined, all combined to present a picture over which the citizen might almost be led to despair. But it is joyful to be able to say that $10,000 has been voted for the reconstruction or enlargement of the jail. While we think the building should have been abandoned, great improvements in its structure and condition can be made.

CAPE MAY COUNTY JAIL.

Cape May Court-House.

Visited April 19th, 1888. Sheriff, James Shoemaker. Keeper, Joseph S. Abrahams. Lives in house connected. Jail consists of two rooms, twenty by twenty-two, one above the other, and made secure by iron ceiling, &c. There are no cells. Last year the lower room was found very damp, and bad odors through the building. The keeper's family were all in ill health. The jail-room below was furred off from the wall, and the floor taken up. Thirteen dead cats found, besides other decayable matter. Several improvements were made, and at reasonable expense. Slop-water goes through pipe to a cesspool quite distant. An inside dry-closet is arranged so that the material can be collected outside, and so that any wetness is prevented. It is well secured and well ventilated, and, with one or two minor imperfections, answers well. No bath-tub; could be easily arranged for. Eight in all committed last year. Only one in jail now. No women committed last year. Justice can commit vagrants; but any special cases could be sent to alms-house. Jail is visited as often as necessary by those who look after moral instruction of inmates.

Although the jail could not be an example to larger counties, it now illustrates the advantage of good oversight, and probably has less inmates, because those committed there find it lonesome. Since the new arrangement of cesspool and outbuildings, the water has greatly improved, as well as the health of the jailor's family.

GLOUCESTER COUNTY JAIL.

Woodbury.

Visited April 24th, 1888. Sheriff, F. B. Ridgway. Physician, Dr. L. Redding. Location, high and good. Basement mostly above ground. Soil, sandy loam. Jail erected twelve years ago. Floors, concrete. Have no bedsteads. Do not furnish clothing or underclothing. Furnish towels. No bath-tub. Laundry work conducted in jail. Movable wash-tub. Turnkey provides hot water. Inmates are fed in the corridors. The sewage runs into a drain that drains the court-house and goes on to the creek, about 400 yards distant. Self-acting water-closets. Water-supply from iron tanks in attic. Might now have city water. Roof tin and painted. Ventilation by vent-pipe in cells to air flue. Furnaces for the jail and house. Seventy-nine names on list since April 24th, 1887. Two-thirds are justices' commitments. Four were women. Eight were under twenty-one; three under fifteen. Some are arrested drunk and let out next day. No longer take tramps; once had sixty-two one night. Allowance, fifteen cents for each meal. Only one death past year. Allowed daily papers, except in special cases. One person detained as witness the past year.

REMARKS.—This is one of the best jails in the State. The attention of the Sheriff was drawn to two or three minor improvements needed.

HUNTERDON COUNTY JAIL.

Flemington.

A report made formerly in reference to this institution drew attention to certain needed improvements, and suggestions were made as to how the conditions might be changed. These changes have been made to a certain extent. The jail consists of five compartments, with a hall-way, and in these there were, formerly, very poor closet arrangements. These closets were removed, as we suggested, and a new one has been made in one of the larger compartments. Upon examining the closet at the end of a hall-way the following conditions were found: The closet was flushed directly from the water-pipe, about three inches above where the cock for the sink delivered it, and as it is customary in the jail to keep the water flowing into the closet all the time, whenever the water flowed into the sink, an up-current was drawn from the closet and mingled with the drinking-water. With the cock opened in the sink, a piece of lighted paper was drawn to the point of water-flush, under the closet seat. The suggestion was made that either the connection should be broken between the drinking-water supply and the closet, or an automatic flush tank should be attached. The jail, in other ways, was in good order. A boy thirteen years old was retained for stealing, and had been in the jail three months, which must necessarily, as a method of training, result disastrously in one so young.

MERCER COUNTY JAIL.

Trenton.

The Mercer county jail was visited April 9th, 1888. Located at Trenton, N. J. Chief Warden, John G. Muirheid. The jail has a few cells under the court-house, but nearly all in an extension. Court prisoners are kept as far as possible in the cells under the court-house. Prisoners sentenced by justices and police justices are known as short-term prisoners, since they cannot be sentenced for over ninety days. These make up about two-thirds of the sentences, and include, chiefly, drunkenness and vagrancy. The buildings are owned by the county. The area of grounds available to prisoners is about 200 feet square. The buildings are of stone and brick. Those in jail who are sentenced by the court may, after forty-eight hours, be transferred to the State Prison if so ordered. The jail was erected in 1836, but has since been extended. There are, in all, forty-two cells for males, of which ten are in the basement, which is two and a half feet below ground, and all the rest above ground. There are eight female cells, all above ground. Floors are concrete. Walls are whitewashed. All inside fixtures are connected with the sewers, instead of, as formerly, with an intervening cesspool. Could not get full particulars as to the character of the underground inside pipes, or as to the trap between inside fixtures and sewers. No ventilating shaft to sewer system, but an intermediate pipe is claimed to ventilate near the curb outside. There are indoor water-closets in every cell. Those in the old jail are of the hopper style and self-flushing. Those in thirty-two newer cells are of the same shape, but do not work automatically, and are covered over on the seats with foul wood covers. There is one bath-tub, with hot and cold water, in the male department. Should be two—one in female department. The bath-tub in male department has back of it an illy-contrived receptacle for waste, which should be removed. There is no sanitary map of pipes and fixtures and drains. All slop-water goes from sinks into sewer. Disinfectants are used, but not with exact knowledge of their value. The water-supply is from the general supply, and is in every cell; supplied by gravity. The building is not wholly fire-proof. No fire-escape, as prisoners are kept on first floor. Depend on natural ventilation and on the corridors, which are roomy. Each cell has a small hole as a theoretical ventilator, but not effective. The heating is by steam. There is, at times, much overcrowding. In the old part the space of four cells is eight by four by twenty; height, eight and a half feet. Six others are six and a half by twelve; ceilings, eight feet. In newer part cells are six by eight. Generally two in a cell, and sometimes four. The average of inmates last six months, 100; highest number, 121. Now perfecting a plan by which the vagrant cases will have smaller cells for separate confinement, thus relieving the crowding and reducing the attractions of the jail as a social rendezvous. Believe this will, in the end, save as to numbers. Wood-sawing has proved unprofitable. The dietary is good and paid for by the county. Costs about fourteen cents apiece per day.

The female department is entirely separate, and well managed. Averages about twelve. A Matron employed, and much sewing done for the jail.

Clothes are furnished to prisoners when necessary. It is believed to be economical to encourage cleanliness by cheap clothing given to the inmates. No towels are provided; should be. Lighting is by gas.

In general, it can be said of this jail that it is gradually improving much in care and construction, and, with the exceptions named, is well arranged and disciplined. The Warden is very well informed as to what is needed, and there is increasing effort to make the jail what it should be. Soon after my visit the following letter was received:

"WARDEN'S OFFICE, MERCER COUNTY, N. J.
"JOHN G. MUIRHEID, WARDEN.
"April 21st, 1888.

"*Dr. E. M. Hunt:*

MY DEAR SIR—Since your inspection of the Mercer county jail, the Court-House Committee, at your suggestion, has ordered and contracted for *cast-iron* covers for all the jail sinks.

"They also have had provided a liberal supply of towels for prisoners' use.

"Mr. Coxon, the Director of the Board, informs me that the apparatus in the walls of the cells, the object of which you inquired about, are for the purpose of ventilation.

"Very respectfully yours,
"JNO. G. MUIRHEID."

MIDDLESEX COUNTY JAIL.

This jail is provided with two departments—a male and female—which are distinct and separate. The male department has ample accommodations, containing twenty single and double cells. These are all well whitewashed and were in excellent order. The cells are arranged on two floors, and the corridor is thoroughly lighted by a large skylight, which is available as a foul air outlet.

There were forty inmates confined. The female department contains eight cells, and all the closets were in good order. Over the female department there are the same number of cells, but this is kept for witnesses, except when the jail is overcrowded. As it is more modern than the other parts of the jail, it surpasses it in construction. The plumbing, heating apparatus, &c., are in good order.

The whole jail showed a regard, upon the part of those in charge, for the laws of cleanliness.

MONMOUTH COUNTY JAIL.

This institution is well arranged. It has a central tier of cells, all of which were in good condition. The female side is somewhat crowded. All the closet arrangements were in fair working order. The drain leading from the floor of the prison, which receives the wash of the floors, &c., crosses a roadway behind the jail, and as an open drain passes into the cesspool. This was very offensive, and the attention of the local Inspector was called to it. As the town has no sewer system, the jail has to depend upon the cesspool, which has to be emptied very frequently. The only other point noticed was the discipline of the jail.

This can certainly be improved. The free-and-easy way in which the prisoners pass away their time, lying on the tables, playing cards, &c., the general look of comfort and happiness, certainly do not tend to produce any fear of the punishments which it is supposed that the law holds out to the law-breaker. Such may, in good part, be overcome, and by rigid discipline and good order, better habits and better morals would be less hopeless. These conditions exist, not only in this institution, but unfortunately in many, and attention is drawn to the fact, that better order and discipline may result.

OCEAN COUNTY JAIL.

Toms River.

This jail, until the past year, was in such condition as to render it unfit for use. Dr. Mitchell, as an Inspector of the Board, visited it, and, together with the attending physician and the Secretary, suggested the chief features of a plan for its improvement. These have been quite fully carried out. Another Inspector visited it September 4th, and reports as follows:

> "The jail is quite well arranged. The cells are ample in number and size. The light and ventilation are good. The closets were not found in good working order. The attention of the health authorities was called to the fact, and attention will be given to remedying the evil. Insufficient water-supply is the chief cause of the trouble."

ESTIMATE OF EXPENSES OF CHARITABLE AND PENAL INSTITUTIONS, AND NUMBER OF INMATES.

Independent of other considerations, we often fail to realize the great cost and increase of taxation which dependency and crime entail upon the State. The constructive expenses for asylums have been between five and six millions. That for prisons, penitentiaries, reform schools and jails not less than three millions, and for almshouses not far from one million. The yearly expenses of the various asylums are not less than six hundred thousand dollars. It is to be remembered that these mostly represent the pauper element of society, or those who have become a public support. The sixth annual report of the Bureau of Labor places the yearly expense of crime, in 1882, at $1,150,000. We now think it not less than $1,500,000. The pauper system of the State costs not less than $600,000.

These results are arrived at by an examination of the State finances and of the returns made each year from the counties, cities and townships to the Comptroller of the State. Some few townships each year fail of return, and so the results are approximate, but always less than the reality. Upon this calculation, beside all cost of construction, the annual yearly expense is somewhere between $2,500,000 and $3,000,000. This, too, be it remembered, is only the institutional record, and stands for a vast amount of suffering to families by reason of those incarcerated or by those thus dependent, and does not estimate the general unclassified charity by thousands and tens of thousands, which the generous sympathy of the people bestows upon families and individuals in their times of affliction and destitution. Is it not wise that the State, in the exercise of a common-sense political economy, and for the general welfare of its people, legislate and co-operate to prevent and remedy this the greatest disaster that befalls civilization and government? It is because of this that we plead in this behalf.

We append hereto a recent return of the various institutions of the State (not including township alms-houses), as giving some idea of the number now provided for:

CHARITABLE AND PENAL INSTITUTIONS OF NEW JERSEY.

Alms-Houses.

INSTITUTION.	P. O. ADDRESS.	Total number of inmates.	Men.	Women.	Children—under fourteen.
Atlantic County	Smith's Landing	16	7	9	
Bergen County	Oradell	34	15	13	6
Tri-Township	Englewood	5	4	1	
Burlington County	Pemberton	288	180	82	26
Cumberland County	Bridgeton	78	46	29	3
Newark City	Newark	175	91	80	4
Orange City	Orange	20			
Gloucester County	Clarksboro	57	31	15	11
Trenton City	Trenton	68	44	24	
Hudson County	Snake Hill, Jersey City	620	220	175	143 males. 82 females.
New Brunswick City	New Brunswick	30	13	17	
Monmouth County		29			
Perth Amboy City	Perth Amboy	6	1	3	2
Morris County	Boonton	86	51	34	1
Paterson City	Paterson	192	69	83	40
Passaic City	Passaic	20			
Salem County	Woodstown	55	27	24	4
Sussex County	Branchville	85	27	38	20
Elizabeth City	Elizabeth	28	18	7	3
Warren County	Townsbury	88	47	33	8
		1,925			

Asylums.

INSTITUTION.	P. O. ADDRESS.	Total number of inmates.	Men.	Women.	Children—under fourteen.
State Asylum for the Insane	Morristown	904	462	441	1
New Jersey State Lunatic Asylum	Trenton	753	381	372	
Institution for Feeble-Minded Women	Vineland	9			
New Jersey Home for the Education and Care of Feeble-Minded Children	Vineland	31	9	5	11 males. 6 females.
Burlington County Insane Asylum	Pemberton	54	11	43	
Camden County Insane Asylum	Blackwood	118	50	68	
Cumberland County Insane Asylum	Bridgeton	12	5	7	
Essex County Asylum for Insane	Newark	418	164	249	1
Gloucester County Insane Asylum	Clarksboro	5	5		
Hudson County Lunatic Asylum	Snake Hill, Jersey City	258	102	156	
Passaic County Insane Asylum	Paterson	49	17	32	
Salem County Insane Asylum	Woodstown	46	23	19	4
		2,652			

Penal Institutions.

INSTITUTION.	P. O. ADDRESS.	Total number of inmates.	Men.	Women.	Children—under fourteen.
New Jersey State Prison	Trenton	921	888	33	1
Atlantic County Jail	Mays Landing	8	7	....	1
Bergen County Jail	Hackensack	21	20	....	1
Burlington County Jail	Mount Holly	111	97	18	1
Camden County Jail	Camden	65	55	10	....
Cape May County Jail	Cape May C. H.	6	5	1	....
Cumberland County Jail	Bridgeton	19	17	2	....
Essex County Jail	Newark	184	150	32	2
Gloucester County Jail	Woodbury	8	8	....	....
Hudson County Jail	Jersey City	199	154	39	6
Hunterdon County Jail	Flemington	4	4	....	....
Mercer County Jail	Trenton	59	54	5	....
Middlesex County Jail	New Brunswick	44	39	5	....
Monmouth County Jail	Freehold	25	22	3	....
Morris County Jail	Morristown	15	13	2	....
Ocean County Jail	Toms River	2	2	....	....
Passaic County Jail	Paterson	72	55	10	....
Salem County Jail	Salem	10	10	....	....
Somerset County Jail	Somerville	12	12	....	....
Sussex County Jail	Newton	2	2	....	....
Union County Jail	Elizabeth	50	41	9	....
Warren County Jail	Belvidere	26	25	1	....
State Reform School	Jamesburg	185	....	....	185
Hudson County Penitentiary	Snake Hill, Jersey City	223	193	29	1
Essex County Penitentiary	Caldwell	189	183	6	....
†Newark City Home	Verona	175	....	....	*148 boys. *27 girls.
State Industrial School for Girls	Trenton	46	....	....	14
		2,681	....	....	....

* From nine to eighteen years of age.

† The Newark City Home is for truant and wayward children, and is an auxiliary to the public school system of the city.

Recall that the alms-house list does not include outdoor relief from poor-fund or voluntary help of hospitals, orphan asylums and private charities, nor the seven township alms-houses of Essex county, Raritan township alms-house in Hunterdon county, three township alms-houses in Mercer county, two in Middlesex county, four in Somerset county, and the many townships that farm out the poor. We reckon the whole of alms-house relief at 2,600.

The State Board of Health uses a schedule of questions for its sanitary inquiries into institutions, a work which the State has committed to its care. It is glad to receive at any time information as to structural or administrative defects from managers, directors or skilled visitors, and will specially investigate when necessary. The other work of inquiry has reference to questions of correction and the best charitable care, and is nearly covered by details under such questions or headings as these:

1. Number of paupers examined.
2. Birthplaces.
3. Birth of parents.
4. Alien paupers.
5. Ages at the time of becoming inmates of alms-houses.
6. Ages at the time of the examination.
7. Length of time in alms-houses.
8. Other forms of relief furnished.
9. Education.
10. Habits.
11. Habits of parents, so far as ascertainable.
12. Habits of the insane.
13. Previous occupations.
14. Previous industrial habits.
15. Condition of ancestors and other near relatives.
16. Grouping of families in alms-houses.
17. Condition of the children of alms-house inmates.
18. Existing cause of dependence, such as—
    - *a.* Homeless children—illegitimate.
    - *b.* abandoned.
    - *c.* by death of father.
    - *d.* by death of mother.
    - *e.* by death of both parents.
    - *f.* by pauperism of parents.
    - *g.* by imprisonment of parents.
    - *h.* Homeless women—abandoned by husbands.
    - *i.* by death of husbands
    - *j.* Old and destitute.
    - *k.* Permanently diseased.
    - *l.* Temporarily diseased.
    - *m.* Crippled.
    - *n.* Deformed.
    - *o.* Blind.
    - *p.* Deaf-mutes.
    - *q.* Insane.
    - *r.* Idiots.
    - *s.* Epileptics.
    - *t.* Paralytics.
    - *u.* Feeble-minded.
    - *v.* Vagrant and idle.
19. Future of the inmates of alms-houses.
20. Report of what ought to be done with each individual.
21. Rules and regulations for alms-houses, &c.
22. General conclusions.

We thus commend this great interest of the care of the criminal and dependent classes to the early attention of this State, alike in their interests and for the common welfare of the whole people.

WATER-SUPPLY FROM WELLS, IN ITS RELATION TO HEALTH.

BY FRANCIS A. WILBER, M.S.,
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In considering this subject, let us notice:

1. The source of supply of well-water; 2. Its collection; 3. The sources of its impurities; 4. Nature's means for removing such impurities, and the failure of these means; 5. The relation between these impurities and public health.

The earth's surface is receiving, at frequent intervals, moisture from rainfall. A large portion of this fall is vaporized, and returned to the atmosphere directly, to be again condensed and re-precipitated as rain. A larger portion penetrates the porous soil, percolating through it, and seeking lower levels, striving to return to the water-courses or natural drains. This portion follows the more porous strata of the soil, and finds its way into all subterranean openings. As the numerous minute underground streams flow on, they unite, just as above ground, and form hidden water-courses, whose distance from the surface depends upon the stratification of the soil and rock. The water of these streams holds in solution all those soluble mineral and organic constituents of the soil with which it has come in contact for a time sufficiently long to dissolve them.

Into these covered streams are constantly percolating the drainage-waters from the soil directly above them. If this soil is porous, and the elevation considerable, the surface drainage penetrates long distances. If the porous stratum that carries the original stream passes under an impervious stratum of clay or rock, these surface additions may cease, and the stream flow on unaffected by the drainage from the soil above it.

The householder, needing water, sinks a shaft through the surface strata until he meets one of these underground streams or water-saturated strata, and the water, finding in this shaft an underground reservoir, either flows rapidly or leaches more slowly in until a supply sufficient for his needs is collected. The shaft may be a deep one, passing through hundreds of feet of soil and rock, until it reaches the underground stream or reservoir. When this is reached, the head forces the water towards the surface, and we call the shaft an artesian well; or the excavation may be only a few feet in depth, when, the saturated layer being reached, the incoming water supplies the needs of the owner of the soil. This is the ordinary well in which hangs "the old oaken bucket."

I have hastily mentioned the source and method of collection of underground water in order to make more clear what I have to say regarding the use of well-waters in the country, or in more thickly-settled regions. I am well aware that these facts are very common ones and that they may be well known to all, but it is to be feared that all sanitary workers do not, at all times, bear them in mind when speaking or writing on questions of water-supply. The only source of supply is the water descending as rain, and the only way in which it reaches the place from which it is taken for the household use is this drainage through the soil.

The water in a well may receive impurities in several ways. The construction of the well may be faulty, so that surface drainage is allowed to flow into the well over its top, or, sinking into the surface soil, force its way through the wall. Or the situation of the well may be such that, while it is free from danger from the immediate vicinity, so far as surface drainage is concerned, it still receives the surface-water from sources of filth more remote. This drainage may flow in, in a practically unchanged condition, or it may be altered, as mentioned later.

The condition in which this filth reaches the well depends upon the distance that it flows to reach it, the time consumed in the flow and the character of the soil flowed through.

The average house-owner certainly believes that the water which he pumps clear and cool from his well is pure and wholesome. He does not stop to think of the impurities with which it may have come in contact during its flow from the surface to the bottom of his well. This well may be sunk in the immediate vicinity of an overflowing cesspool or out-house; the natural drainage of his own or his neighbor's barn-yard or pig-sty may be flowing over the soil, through which is filtering the water that is to fill this underground cistern; or its bottom may be in a porous stratum of soil or gravel that receives, at a point higher than the bottom, the drainage from some grave-yard or other source of decaying organic matter; some neighboring tree may have thrust its rootlets through the wall of the well and there they remain to decay, or the top may not be tightly covered and stray toads or other vermin may tumble in to aid in the pollution of the supply, but our well-owner, not seeing, smelling or tasting the results of these additions to the underground reservoir, is not conscious of their existence. Nor is this indifference to the condition of the soil that serves as a filter for the household water-supply, or the surroundings of the well, confined to the ignorant man. Even the physician may, and in my experience not infrequently does, hold that impurities, mineral and organic, are removed from surface-water by the processes of natural filtration through the soil. If the soil was in a condition of virgin purity, and if the tax made on its filtering power was limited or only occasional, this might be the case. But such virgin condition of purity is not found in the natural filter-bed in thickly-settled or old localities. It is true that in passing through almost any soil-filter, turbid, filthy water loses its suspended matter and becomes clear. It is, therefore, commonly said to be filtered, the popular definition of filtration being the removal of such suspended matter. Filtration is this and much more. The water charged with organic and mineral salts and undecomposed organic matter in minute subdivision passes into the soil. If it has to flow any considerable distance the coarser suspended matter is held mechanically, as the water forces its way downward. At the same time the organic acids in solution act upon the oxides of iron and alumina in the soil, forming soluble compounds of these substances. These compounds, in turn, re-act upon the albuminous matter carried by the water, and coagulate it. The clots thus formed can no longer pass through the soil, from mechanical reasons, and they are consequently removed from the water. Together with these precipitated albuminous matters, and mechanically held by them, goes much of the suspended mineral matter, and a chemical purification of the water has been effected. This, in brief, is true filtration by nature's process.

Now, let the flow of organic impurities through this natural filter-bed be so great as to fill it with this precipitated organic matter. Decomposition of the masses of organic filth thus carried into the soil, takes place, and the soluble products of this decomposition flow on with the underground streams until a well offers a collecting-place for them. Nor is this all. The soil, being taxed by the large amount of impurities sent through it beyond its filtering power, allows these soluble products to pass unchanged, and they are carried directly into the well, where the cessation of flow allows them to accumulate. Such a filth-saturated condition of the soil exists in every old and thickly-settled community. Here every stable, every out-house or cesspool, with their porous-walled (if walled at all) vaults, every kitchen drain and sewer, is furnishing its quota of organic impurities, all of which supply matter for decomposition.

The products of this decomposition are carried, as we have seen, directly to the wells, and they thus become suitable breeding-places for bacterial life—powder magazines—only needing the spark of a typhoid or other deadly germ to furnish the explosion of a scourge of disease. This filth-saturated condition of the soil is no flight of fancy, but solid fact, as every one who has watched the digging of a sewer or other excavation in a town, well knows. In a stiff, impervious soil the collection of organic filth is enormous, and the dangerous character of the organic matter in such soil when it is disturbed, is well known to every physician. Outbreaks of malarial disorders are almost certain to follow such disturbance. Nor are the conditions as to safety greater in a town built upon a sandy or porous soil. Here the organic impurities do not *collect* in such quantities in the soil, but to offset that, the flow from the surface to the water line of the well is more rapid. The well-owner, in this case, can drink, to-morrow, the kitchen slops or more nauseous wastes emptied yesterday upon the sand near his well. In districts underlaid by rocky strata, the danger does not disappear, as the seams in the rock, or faults in stratification, furnish convenient inlets for surface filth. This filth-polluted water, collected from either rocky strata, porous or compact soils, does not always (perhaps we might say does not usually) advertise its dangerous character. It is apt to be clear and cool, and is sought after for household use. There are no visible signs to show its condition, and the well-owner is usually prompt to resent as a personal grievance, any suggestion that the water is unfit for use. Striking instances of this could be given, but I will mention only one or two.

In New Brunswick, a well known to have been in use for more than 100 years, was located directly in the rear of a tenement-house and its surrounding out-houses. This house was used for many years as a tavern, the slops from the kitchen being discharged in the immediate vicinity. Near by was an old stable-yard and stables, the surface drainage from both being directly towards the well. The soil in the entire vicinity was completely saturated with organic impurities, and although the supply that fed the well did not come from surface or local drainage, it was supplemented by both. The water from this well was clear, cold and agreeable to the taste, and was much sought after for drinking purposes. Chemical and bacteriological tests showed it to be the merest sewage, and yet when the facts were stated, many persons using the well were greatly offended at the *attack* upon the character of this water.

Another case was that of a well situated in a depression in the red shale that had become filled with sand. The water was used by numerous families, and during the summer there was scarcely ever a time when some one in this vicinity was not suffering from low fevers or bowel troubles. The quality of the water was shown, and the well closed by the Board of Health, and great was the cry at the *injustice* inflicted upon this locality.

The popular indifference to the condition of the soil surrounding the household water-supply is very great.

Men who would not for an instant allow the presence of filth in connection with the bread or meat put upon their tables, will not give a moment's thought to the state of the filter-bed through which passes the water daily used by their families. Worse than that, they will deliberately make large additions of household filth to the surface of this filter-bed.

It is not my province to set forth the full effects of the use of water thus filth-saturated, upon the public health. The condition of the soil in country, village and town is, in many cases, such that such water, only, can be obtained from the wells sunk in it. The physician can tell you that, while water containing organic impurities may not be a direct producer of disease, it still can work its evil by inducing a gradual lowering of the tone of the system. Persons using such water are less able to withstand the assaults of prevailing diseases. This is particularly the case when this water is used by small children and aged and infirm persons. I firmly believe that a large proportion of the deaths of infants, during the heated term of our summers, is directly induced by the use of just such water, and in many cases coming under my own observation this belief has been directly confirmed.

Add, now, to the direct results of the use of filthy well-waters the indirect danger that they furnish in providing breeding-places for disease germs, and the most convenient means for distributing such germs and introducing them into the systems of those using them, and you have an indictment sufficiently strong to insure conviction unless the grounds taken here can be disproved.

Health authorities, everywhere, recognize, to some extent, the dangers to public health arising from the use of well-waters in towns and cities. The labors of such officers would be greatly lessened if it were possible to convince the communities using wells as sources of household water-supply, of the dangers to which they are being subjected. Ignorance lies at the bottom of public indifference to this and similar sanitary matters, and only persistent and wise pressure on the part of those interested in sanitary progress will lead to a removal of this ignorance.

The study of hygiene in the public schools will prepare the public mind for more intelligent thinking on such subjects, and judicious agitation can be made to do its part in this important work.

There are but few towns in our State in which water-supply from wells is at all admissible. In one or two instances, the geological structure underlying a town renders a present use of wells possible. In these cases, a stiff clay, impervious to water, overlies the gravel strata that carries the water. This gravel formation outcrops and receives its drainage-water, entirely outside the town, in a hilly, scantily-settled region. The water flowing underneath the town is, therefore, not polluted by surface drainage, and is fit for use. It will continue to be fit until there are a sufficient number of avenues for the passage of surface-water through the clay made to allow it to become polluted.

In concluding this brief sketch of the dangers to public health arising from the use of water obtained from wells in towns and cities, let me call attention to the great value of pure water as a remedial agent. We know very little of its effects, as the use of water containing mineral or organic constituents, or both, in considerable quantities, is almost universal. Absolutely pure water is one of the greatest luxuries of modern life, and nothing, in our modern civilization, marks more strongly, public enlightenment in matters of health, than does the interest now being taken in the subject of water-supply for towns and cities.

ICE AS A SOURCE OF DISEASE.

BY WM. K. NEWTON, M.D., PATERSON, N. J.

Prior to the publication of an article in the seventh report of the State Board of Health of Massachusetts, on an outbreak of intestinal disorders, attributable to the contamination of drinking-water by means of impure ice, it was almost universally held that ice was not a source of disease. This supposition was based on the facts that water undergoes a change during the process of freezing, and that ice is ordinarily purer than the water from which it is produced. It is also known that many substances are excluded from the water when freezing, as is illustrated in the case of frozen sea-water, which contains less of the salines than the original water. But it has been proven that ice sometimes contains a relatively larger proportion of organic matter than the water from which it is made. Another fact should be noted; that is, that large pieces of organic matter are entrapped in the ice, and are preserved for the time from putrefactive changes, which changes, however, are set up or renewed when the ice melts. Hence, as the ice is formed from the surface-water, all floating particles, or the matter on the surface, in polluted streams or ponds, are caught in the ice and preserved until the ice melts. After appreciating these fundamental facts, let us turn to the evidence in the case and see what may be done to obviate the danger.

The first recorded case, as mentioned above, where disease was traced to polluted ice, is that of an epidemic of intestinal troubles occurring at Rye Beach, in 1875. There broke out at that time among the inmates of a large hotel, a number of cases of bowel disorders, characterized by giddiness, nausea, vomiting and diarrhœa. After eliminating all other possible causes of the trouble, it was ascertained that the ice, which was taken from an adjacent pond, was the sole cause of the outbreak. This pond contained large quantities of putrescent matter, composed of marsh-mud and decomposing saw-dust. The water of the pond was discolored, and, when agitated, emitted a very offensive odor; the mud at the bottom, when disturbed, gave off large volumes of foul gas. It will be seen from the above statement that the pollution in this case was not of animal origin, but that the condition of the pond, and the rotting saw-dust therein, were the causes of the disease.

Kedzie, of Michigan, who also investigated this subject, ascertained that ice taken from streams and ponds containing rotten saw-dust was a cause of diarrhœa.

A similar investigation was made into the character of ice sold at Newport, R. I., which was cut from ponds in the immediate neighborhood of the city, and contained an excessive proportion of organic matter.

Chamberlain, in the fifth Connecticut report, records a fatal case of typhoid fever due to the use of ice from a pond into which the dejecta of another patient, sick with that disease, had been thrown.

The instances mentioned might be considerably increased, but sufficient has been stated to forcibly indicate the dangers to health from this cause.

From the above-mentioned cases, we may deduce the following: Organic matter, instead of being eliminated from ice during the process of freezing, is retained therein. This fact must not be forgotten, for aside from the presence of actual disease germs in ice, the presence of a putrescible material is of itself a source of danger. Hence, ice taken from streams near the outlets of sewers must of necessity contain large amounts of foul material.

Of greater interest to us is an answer to the question, Are disease germs killed by the freezing process? In answer to this, we may quote the following evidence:

Pengra, of Michigan, in State Board of Health report for 1884, showed that bacteria, infusoria and other organisms were found in ice, and that their vitality was not injured by freezing.

Cohn ascertained that a temperature of zero F. was not fatal to certain species of bacteria.

Frisch found that a temperature of -80° F. failed to destroy the vitality of both micrococci and bacilli.

Prudden, in 1887, made an extended series of experiments on the influence of freezing upon the vitality of bacteria. According to his observations, certain bacteria resist protracted freezing, while others fail to grow when they have been subjected to a freezing temperature for a certain time. The bacillus prodigiosus was destroyed by being frozen for fifty-one days. A bacillus in Hudson river ice survived a low temperature for seventy-seven days. The bacillus of typhoid fever survived after 103 days; repeated freezing and thawing, however, were fatal to the latter.

The effect of high temperatures on the various germs has been very thoroughly studied, and the results of these experiments are satisfactory; the effects of low temperatures, on the other hand, are not so well known. But from the above-mentioned experiments it may be stated that low temperatures are not always fatal to organisms of the lower orders; the effect of freezing being only a paralyzing one for the time being.

We may sum up as follows: The use of ice cut from streams, ponds or lakes polluted by sewage or organic refuse of any kind, is dangerous to health.

This being the case, it is the duty of sanitarians to educate the people to an appreciation of the fact and to urge on the Legislature and Health Boards the necessity of checking the sale of polluted ice.

Laws on this subject have been passed in the States of Massachusetts, New Hampshire and New Jersey.

In Massachusetts no horse can be driven on a field of ice that is to be used for domestic purposes. Upon complaint from twenty-five consumers that ice is impure, the State Board of Health must investigate.

In this State a law passed in 1882 provides a penalty for the punishment of persons who willfully pollute ice-ponds. In 1885 a law was passed that contains the following provisions: No ice shall be cut, for purposes of sale, in any city, from any pond, creek or river within the limits of said city, unless permission so to do shall first have been obtained from the Local Board of Health of said city. No ice may be sold in any city without a permit so to do from the Local Board of Health. Such permit may be refused if the ice is from an impure source. Boards of Health in cities may prohibit the sale if from an impure source.

If the provisions of this law were extended to boroughs and other municipalities, and then strictly enforced, all dangers from this source would be removed.

THE WATER-SUPPLIES OF NEW JERSEY.

BY A. CLARK HUNT, M.D., SANITARY INSPECTOR.

It has long been apparent that every advance in methods for protecting the health of the people must include a full knowledge of the water-supply used for drinking purposes. There has not only been of late years great advance as to methods for testing the conditions of various waters, but also our knowledge of the relation of impure water to disease has been largely increased. While it is admitted that drinking or potable water may contain many organic materials which do not cause declared disease, and that much depends on the character of these materials and the state they are in, yet the direction of all our facts is to show that in such case undue and unnecessary demand is made on the vital forces. We have *standards* of pure water, and it is in the interests of mankind, and of animals, too, that pure water be sought and used. With impure water, although persons, and even communities, may for a long time escape palpable evidence of injury, it is never known when the danger line will be reached. A drought or a freshet, a certain number of unusually hot and humid days, or the arrival in town of some specific form of fever, may at once permit the condition of the water to determine the outbreak of pestilence or the great spread of some form of diarrheal disease. We should not take such risks.

But not only has the advance of science certified the differences between pure and impure water. The observations and the clinical experience of physicians fully confirm the view that water, and that impure water especially, is the carrier, perhaps the originator, of specific diseases. It determines their activity and is the chief vehicle for their spread. This does not mean that all impure waters produce disease in all persons. Besides the kind and degree and condition of the contamination, the condition of the *individual* is a factor. The susceptibility of one and the vital resistance of another are often alike inexplicable. But our text-books and our experiences are such that no physician with a wife and a family of children desires to provide them with water abounding in putrescent organic matter, or with such exuberance of low and decaying plant life or of micro-organisms as is never found in good water. Hence, whatever may be the captiousness of individuals, the chief authorities in chemistry, biology and the care of the public health, as well as the people, are in accord that our water-supplies should furnish good water.

While this, as a rule, is to be had from deep wells, it is only so because (*a*) they have good percolating surroundings, and (*b*) can be protected from surface contaminations. Both of these requisites cease to be true when human habitations are so crowded and so mingled with factories, stables, out-houses and all the necessary off-fallings of life, that the ground ceases to be a good percolator and has to receive debris and contamination on every side. Hence it is that in every close city the time comes when the well which was good for the family in the lone house is not good when twenty families and a hundred people live within a hundred feet of it. So the public or city water-supply becomes a necessity.

We have so many cities in this State, and so many villages that are coming to be cities, that no question relating to the public health is more important. Facts which came more fully in our possession last year, in inquiries into the interests of the immense population now depending on the Passaic as a water-supply, as also facts as to Camden, and as to various smaller cities, led this Board to direct an inquiry into the water-supplies of the State.

This inquiry was not meant to include, at present, a thorough investigation into the quality of supplies, such as would involve weekly or monthly chemical and other examinations, but to acquaint us with certain preliminary facts, as also to inform us as to how far the water was affected by modes of storage. Also, as to the present acceptability of the supply, and as to how far the people living in cities having a public water-supply, had substituted it for wells. A. Clark Hunt, M.D., as a Health Inspector, was put in more special charge of the inquiry.

As a guide, and yet not as including all the information desired, the following schedule of questions was used:

"STATE OF NEW JERSEY,
"STATE BOARD OF HEALTH.

"Please fill out such portions of this blank as are applicable to your water-supply, and forward to office of the State Board of Health, Trenton, N. J.

"Some of the blanks have been partly filled from information now in the possession of the Board: please correct if wrong.

DATE, ———— 18 .

"1. Name of city or town.

"2. Population, 18 .

"3. Date when works were built, and by whom designed. If not all built at one time, state what additions were made, and when. (See Plans.)

"4. By whom are works owned?

"5. Source or sources of water-supply.

"6. Area of water-shed supplying such source or sources.

"7. General geological and topographical character of the water-shed.

"8. Mode of supply, whether by gravity or pumping, and whether distributing reservoir, stand-pipe or tank is used.

"9. General description of storage and distributing reservoirs—natural or artificial, how constructed, area of water surface, capacity, character of bottom, amount of shallow flowage, &c.—times of cleansing.

"10. Does all water pumped go through the distributing reservoir or tank?

"11. What portion of the water pumped goes into the distributing reservoir?

"12. Whether or not the water is delivered into the distributing reservoir at one side and drawn out at the other.

"13. Number, kind, size and depth of wells used as sources of water-supply.

"14. Miles of mains, sizes, taps.

"15. Number of hydrants.

"16. Ordinary pressure.

"17. Fire pressure.

"18. Meters.

"19. Describe filter-galleries or basins, and connections, if any, with stream, pond or reservoir.

"20. Average daily capacity of works in dry year.

"21. Daily average consumption.

"22. Number of houses using the water.

"23. Is water supplied to any one outside of your town or city?

"24. Material of distributing mains.

"25. Material of service-pipes.

"26. Does the water-supply receive sewage, drainage from factories (mentioning kind), or other pollutions?

"27. If there have been any bad tastes in the water, or excess of vegetable growth, or if the fish have been generally affected, and such occurrences are not fully described in printed reports, please describe the same and the remedy adopted, if any. Send each year, printed report to this Board.

"28. Have analyses of water from the present source been made? By whom? When? If not given in printed reports, please furnish copy of same.

"29. Have records of the temperature of the water been taken in the past? If not printed, will you furnish copies if blanks are sent?

"30. If you keep records of the temperature of water, please furnish.

"31. Do you take samples of water for analysis each month, for information and comparison?

"32. To whom shall future correspondence be addressed?

"33. Name of person furnishing this information."

We believe it best to give the facts just as they have been elicited. While in all material respects correct, yet it has sometimes been found difficult to secure all details. This has arisen in most cases from a want of knowledge of all the facts by those in charge or the absence of the particular person who was presumed to know. Where an engineer has been in charge there has been no embarrassment, but some of the water companies have no engineer really in charge. Sometimes there has been indisposition to state the number of houses supplied.

While many very satisfactory water-supplies have been found, the facts elicited chiefly point to need of attention in the following directions:

I. Too often the original choice of supply has not been competently made. It has generally been made by those of good intent and of ability in the lines of their particular callings, but without familiarity with rainfall, water-sheds, population, apparatus and all the varied information that should be in possession of some one guiding the source of supply and the plant by which it is to be introduced, stored and distributed.

II. While many of the companies supplying cities have been of great service, two classes of cases prove embarrassing—those in which most respected and wealthy persons are stockholders, receiving good dividends and seeming to become very conservative as to the quality of the supply, and, second, those cases in which outside parties have formed a corporation for speculative purposes and are not particular enough in all the details of healthy and effective service. While in some cases, no doubt, it is better for cities to depend upon responsible and energetic companies, generally a city should own its water-supply.

III. Even where the quality and quantity of supply is satisfactory, there is too often neglect as to reservoirs, pipes, connection in houses and modes of distribution.

IV. Where the water is for a time objectionable there is not enough thorough investigation of causes. For instance, we have known a water-supply to deteriorate for weeks and yet call forth no investigation from a company, even though it is known that, in other cases, covering of reservoirs, the introduction of oxygen or clarification by alum under expert direction, have in a very short time removed the evil.

V. Even where the water-supply is good it is often lamentable how little it is used, the people still clinging to the old well after it has come to represent the drainage of the neighborhood. Just at this writing two samples from two wells in two cities show much contamination.

Under the four first-named heads we might have given some flagrant examples in the State that have come under the direct knowledge of the Secretary and of the Sanitary Inspectors, but prefer at present to draw attention to the supplies in general. Our thanks are due to individuals in charge for much valuable information.

In connection with the visits and investigations made, many suggestions have been given, and we have already found that the local water-supplies were being examined with more technical care. We believe that this inquiry is of great value to the localities and that it will aid not only to guide them, but also to assist others, in their plans for the future. It is known to us that not only many cities, but some of the towns of less size, feel themselves forced to meet this question, and it is of the utmost importance that no mistakes be made in the start. The introduction of a good water-supply under expert direction and with such financial care as to secure it at a reasonable expense, is always an excellent investment for a city, but the introduction of a poor or inadequate supply in an imperfect way is an experiment disastrous to all public improvement.

No State in the Union has a better supply of salt water and fresh—none that has so available a supply of good drinking-water—for its population, taken as a whole. We still believe that the State should secure to itself its abundant resources, as so often presented by the Board of State Water Commissioners, the State Geologist and by this Board. We hope, at least, somehow, there will in the near future be a great improvement in the supplies to some of our cities, and that those now seeking a supply for the first time will not repeat errors perchance excusable thirty years ago, but by no means excusable now.

The following are the places whose water-supplies have been examined, embracing, we believe, all places that have perfected a supply:

CITIES HAVING PUBLIC WATER-SUPPLIES.

Asbury Park.
Atlantic City.
Bayonne.
Belvidere.
Beverly.
Bordentown.
Bound Brook.
Burlington.
Bloomfield. (See East Orange.)
Bridgeton.
Camden.
Cape May.
Dover.
East Orange.
Elizabeth.
*Englewood.
Flemington.
Gloucester.
*Hackensack.
Haddonfield.
Hackettstown.
*Hoboken.
*Harrison. (See Jersey City.)
Jersey City.
Kearny. (See Jersey City.)
Lambertville.
Long Branch.
Lakewood.
Merchantville.
Millville.
Morristown.
Moorestown.
Mount Holly.
Montclair.
Newark.
New Brunswick.
Orange.
Ocean Grove.
Passaic.
Paterson.
Pennington.
Perth Amboy.
Princeton.
Rahway.
Red Bank.
Salem.
Somerville.
Trenton.
Washington.
Wenonah.
Woodbury.

The following are the questions on water-supply which were used as guides in the inquiry:

Name of city or town.
Population.
Number houses.
Date when works built.
By whom designed.
Additions, &c.
By whom owned.
Source or sources of supply.
Area of water-shed.
Geographical and topographical characteristics.
Mode of supply—gravity or pump.
Is there distributing reservoir?

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*Supplied by Hackensack Water Company.

General description of reservoir—natural or artificial, how constructed, area of surface, capacity.
Does all water pass through reservoir, or do you at times pump direct?
What proportion goes through the reservoir?
Where does water enter the reservoir?
From what part is it drawn?
How often cleaned.
Number, size and depths of wells used as sources of supply.
Miles of mains. Sizes.
Are there many dead ends?
Number of taps.
Number of hydrants.
Number of houses using the supply.
Ordinary pressure.
Fire pressure.
Is supply by meters or by schedule?
Describe filters.
Average daily capacity.
Daily consumption.
Is it supplied to any one outside of your town?
Material of distributing mains.
Material of service-pipes?
Does water-supply receive sewage, drainage from factories or other pollution?
Describe foreign tastes, smell or vegetable growths, if fish affected, and if any of these, what remedy is used.
Has analysis been made? When? By whom?
If printed, in what report?
Name of person giving the information.

The following are the notes as to localities, furnished by the Inspector after examination:

ASBURY PARK.

Asbury Park has a population of 2,124. This, of course, does not include the summer floating population. There are 502 houses. The water-works were started in 1886 and completed in 1888; designed by Mr. Isaac Carson. The plant is owned by the city. The water is obtained from artesian wells, located near the head of the lake and along the railroad. The deepest well is 560 feet; the most shallow one, 425 feet. There are, in all, 20 wells, varying in size from 3 to 6 inches in diameter. Only 17 of these are in use. The wells yield from 4 to 40 gallons per minute. The water is pumped from the head of Fletcher lake to the stand-pipe, which is situated on Second avenue, near the railroad. This stand-pipe is 125 feet high and 12 feet in diameter, and has a capacity of 100,000 gallons. There is also an auxiliary pumping-station in the stand-pipe lot. There are between 10 and 11 miles of pipes, running in size from 2 inches to 3 inches in diameter. There are 524 taps and 60 double-nozzle hydrants. The pressure under the stand-pipe is 60 pounds; ordinary pressure is from 30 to 40 pounds. The daily capacity is not determined, but is sufficient for present needs. The wells do not yield as much as the pumps require. The consumption in summer is 750,000 gallons per day. The system of pipe is almost a complete loop system.

Several analyses have been made by Profs. Cook and Chandler, and also by Dr. Christine, all of which were satisfactory. The water is pure, sparkling, but somewhat hard.

ATLANTIC CITY.

Atlantic City has a population of 7,942. This is increased in summer to 30,000. The number of houses is 1,725. The works were erected in 1880; they are owned by the Wood company. The source of supply is from the mainland; it was first the overflow from a mill-race, but now the company own the mill-pond. It is difficult to estimate the water-shed, as the land is sea-made. The pond not yielding a sufficient quantity, driven wells were put down around it, from which the supply is now obtained. The water is pumped to a stand-pipe. The consumption in summer is 50,000 gallons, some days. There are 10 or more miles of pipes. The pressure is from 40 to 60 pounds. The capacity is not estimated. The charges are regulated by meters and schedule. The number of houses supplied is 1,207; of these 281 are hotels and boarding-houses. The water is regarded as good, but no recent examinations have been made.

Two years ago the "Consumers' Water Co." was formed. They have sunk one driven well 1,100 feet and obtained a copious supply of water, which is free from organic matter, but which, when warm, has a taste of sulphur. The well is about 1,200 feet from the ocean; it was completed three months ago. The temperature at first was 64°. It flowed 175 gallons per minute, and rose from 10 to 15 feet. It is now being pumped, and is nearly ready for introduction. Surface wells are fast disappearing from Atlantic City.

BAYONNE.

Bayonne has a population of 13,080. There are 1,779 dwellings in the city. Bayonne includes Bergen Point and Centreville and Sallersville. The source of supply is same as that of Jersey City, namely, the Passaic river above Belleville. Water is received from a reservoir in Jersey City, located between Central and Summit avenues. The pressure is 45 pounds. Pipes are of cast iron. They extend over 9 miles. The mains are 20 inches in diameter; and six-inch pipe is the smallest used for distribution. There are 72 hydrants; and 1,000 dwelling-houses are supplied. The capacity is very great. The consumption is not reckoned, as it is not separated from the Jersey City supply. There are numerous complaints as to taste and discoloration, and at times the water is very unpleasant for drinking purposes.

BELVIDERE.

Belvidere has a population of 1,814. There are 394 dwellings in the town. The water-supply was introduced in 1879. The source of supply is the Delaware river. The water is pumped to a stand-pipe 16 feet in diameter, and 160 feet in height. The supply is owned by a private company. There are 3 miles of pipes. The main is 10 inches in diameter. The distributing pipes run from 8 inches to 4 inches in diameter. There are 34,000 gallons stored. The pressure is 70 pounds. The average consumption is 50,000 gallons per day; 160 houses use the supply. A test of the water, taken directly from the hydrants, is very satisfactory. The water is apparently very pure and wholesome.

BEVERLY.

Beverly has a population of 1,973. There are 425 houses. The water-works were completed 1887. They were designed by the Gloucester Iron Works. There have been no additions. The plant is owned by the Beverly Water Company. The source of supply is the Delaware river. The water is pumped directly to a stand-pipe, which has a diameter of 12 feet and is 100 feet in height. The capacity is 90,000 gallons.

The water can be pumped direct, in case of fire. There are 6 miles of pipes. There are 160 taps and 44 hydrants. The number of houses using the water is about the same as the number of taps. The pressure is from 30 to 47 pounds. Water is supplied upon a schedule of prices. The water is filtered at the intake. The average consumption is 30,000 gallons per day. The main is twelve-inch and distributing-pipes run from ten-inch to four-inch. The material is cast iron, tested at 300 pounds. Edgewater, Beverly township, receives the same supply. Water has thus far been very satisfactory. There is no printed analysis of the water.

BOUND BROOK.

The supply is not yet completed. It is controlled by the Bound Brook Water Company. Mr. Sylvanus Ayers, Jr., is the engineer and manager. The source of supply is the east and west branches of Middle Brook, which secures a water-shed of about 70,000 acres. The dams which are prepared are 2¾ miles from the lower part of town, and the source of the streams is from 6 to 8 miles distant. The first dam on the east branch will be 71 feet long and an average of 15 feet solid masonry, and will hold 1,250,000 gallons. The second will be built about 300 feet above the first, and will be about 300 feet long and an average of 10 feet in depth, and will give storage of 11,000,000 gallons. The first dam is 110 feet above the lowest level of the town and the second is 13 feet higher. The yield has not been estimated. The amount that can be supplied will be at least 250,000 gallons per day. The pressure will be between 40 and 50 pounds. The main will be 10 inches in diameter and of cast iron. The analysis is very satisfactory. The supply is expected to be one of great merit.

BORDENTOWN.

Bordentown has a population of 4,683. There are 1,211 dwellings in the city. The supply is owned by the Bordentown Reservoir and Water Company, and was introduced in 1853. The supply represents springs and a water-shed in the pine district. The capacity has not been calculated. The water is taken from Crosswicks creek. The water is pumped to a reservoir, which is situated 1 mile back of the town, near the cemetery. The capacity of the reservoir is 500,000 gallons. The pressure is from 30 to 40 pounds. The water can be pumped direct in case of fires. The well at the pumping station is 18 feet deeper than the bottom of the creek. This is cleaned out every year, and from 1 to 2 wagon-loads of mud removed. The presence of this mud is about the only *serious* matter with which the company has to contend. There are 6 miles of pipe, running from 6 to 4 inches in diameter. Chemical analysis of the water is said to be satisfactory. I did not obtain it. The daily consumption amounts to 100,000 gallons. There are 300 consumers. The water is soft and pleasant. The wells in the city are very shallow, and the water in them is contaminated by surface soakage. This fact seems to force the necessity of using the public supply. The adoption of some good filter will probably improve the present supply to a great extent.

BLOOMFIELD.

Bloomfield has a population of 6,702. There are 1,033 houses. Two hundred and fifty of these are now supplied with water, and the number is steadily increasing. For further particulars as to source, &c., see East Orange supply.

BRIDGETON.

Bridgeton has a population of 10,065. There are 2,093 dwelling-houses in the city. The water-supply was introduced in 1878, and is owned by the city. The supply is taken from a mill-pond, which is fed by a stream which arises in the cedar swamps. This stream is about 5 miles long. The pond is situated within the city limits, and has a storage capacity of 90,000,000 gallons. The water is pumped to a reservoir 1 mile from the city; this has a capacity of 1,500,000 gallons. In addition to the pond supply, during the past year a well was dug for the purpose of improving the quality of the water; this well is situated below the dam, and is 30 feet in diameter by 20 feet in depth; the digging was through pure, white sand; this well lowered the water in the stream, flowing from the retaining reservoir. The retaining reservoir is situated below the dam, and holds 2,000,000 gallons. The temperature of the water in the well is from 53° to 56°; that of the surface-water in the pond last year, reached as high as 90°. During a certain period last year, the water had a bad taste and smell;

the main source of supposed contamination has been from a canning factory which is at the head of the pond, on the borders of a swamp through which the feed-stream runs; for years this swamp has been used for the deposit of the refuse from the factory, and the ground has become saturated; analyses made by Messrs. Austen and Wilber, show conclusively that the contamination was from this source, as the water above was exceptionally pure; greater care is exercised by the factory at present, but the ground should be improved by digging out and filling with good gravel. The well yields 500,000 gallons per day. The daily consumption is 247,000 gallons. There are 1,100 taps, and about the same number of houses are supplied.

There are 16 miles of pipe. The mains are 11 inches in diameter, and the distributing-pipes are some of them 3 inches in diameter. The house connections are of galvanized iron. The water from the pond is soft, and that from the well, hard. The well is covered and ventilated. The pressure is 30 to 50 pounds. The reservoir has been cleaned once in six years, and only three-fourths of an inch of sediment obtained. The well is quite shallow, and has shown, already, a slight tendency to taste. The dangers of contamination are the swamp and the fact that the natural drainage of some of the streets flows into the pond; if these are carefully watched, there is no reason why the supply should not be pure.

BURLINGTON.

Burlington has a population of 6,553. There are 1,385 houses in the city. The water-supply was formerly owned by a company. Works were built in 1804. The city purchased the plant in 1877. The whole arrangement, buildings, &c., were changed, as the old pipes were too small, and the service was very imperfect in many ways. The water is taken from the Delaware river and is pumped to two wrought-iron tanks. These, combined, hold 90,000 gallons. The pressure is 20 pounds. The capacity is 2,000,000 gallons per day. The average daily consumption is 350,000 gallons. There are 1,600 taps. There are no meters. There are 9 miles of pipe, running from 24 inches in diameter to 4 inches. House connections are of lead. The water has no bad taste. No analyses are recorded. The supply is pronounced satisfactory.

CAMDEN.

Camden has a population of 52,884. There are 10,522 houses in the city. The water-supply is owned by the city. The water was introduced in 1870; prior to this, from 1845, it belonged to a chartered company. The water is taken from the Delaware, at Pavonia, and is pumped to a stand-pipe, and from thence to a reservoir. The stand-pipe is 5 feet in diameter and 127 feet in height. There is an additional stand-pipe, which is 10 feet in diameter by 88 feet in height. The reservoir is square, with a five-foot bridge-wall. Its dimensions are 224 feet at the top, by 344 feet. The water can be pumped direct, if necessary. The mains are 30 inches in diameter, and the distributing-pipes run down to 4 inches in diameter. Pipes are of cast iron. There are, in all, 52 miles of pipe. The capacity is practically unlimited; 5,000,000 gallons are pumped per day. Analyses have been made from time to time. Most of the houses are supplied. The pressure is from 40 to 50 pounds. The city uses both meter and schedule. It is very hard to ascertain the number of houses connected, as the old company had no regulation as to way of tapping, &c. The water, by analysis, is said to be pure and good, but as it is taken from the river there is great risk of contamination. The supply should certainly be examined very frequently and carefully. We believe the committee of council has done wisely in advising a new source of supply.

CAPE MAY CITY.

Population in winter, 1,610, census of 1885. Houses, 246. The city was among the first to have a driven well as a public water-supply. The first well was an artesian, 6 inches diameter, 96 feet deep, with a good supply. The water was of a yellowish color, an iron taste, and unfit for drinking purposes. The well was put in about 1874, and abandoned in 1885. The next was a surface-well, near the schoolhouse. Then followed the one near Madison avenue. The Madison avenue works are used still in the summer season about two or three weeks, then only about three hours daily, so as to give the large well a rest. This is scarcely necessary. After this last well was dug, the supply was insufficient. Then a series of six-inch wells were sunk 50 feet, and they proved a failure on account of fine sand, the supply being only about 100 gallons per minute. Then the large well, 30 feet in depth, was made, which is one of the best investments the city ever made. This is about one mile from the city.

The water stands in the well seven feet from the surface, except when heavily pumped. It is distributed from tanks holding 60,000 gallons each, into which it is pumped by a Worthington pump. These tanks are cleansed each spring. The water is softer than in the city. It is distributed to houses and through the city in the usual way. Most of the houses and hotels take it, but I could not ascertain the exact number. Some private wells are still used.

DOVER.

Dover has a population of 3,170. There are 527 houses in the town. The water-supply has been recently introduced; the plant was finished November, 1887, and was accepted by the town, March, 1888. The supply is owned by the Dover Water Company. The engineer was Mr. Isaac S. Carson. The water is taken from springs, which are about 1 mile from the city; there are 16 springs, each of which is walled up, and covered with a cast-iron door. Terra-cotta pipes, 10, 8, 6 and 4 inches in diameter, lead from these springs to the reservoir. The reservoir is in a cup-shaped depression, and the pipes lead from it, 2½ miles around the hill, to the town, as gravity is the only force needed. The reservoir is 170 feet above the level at the corner of Sussex and Blackwell streets. It is constructed of stone and earth-work, and is divided into two divisions for cleaning purposes. Its dimensions are as follows: 190 feet 6 inches by 221 feet at the top of each compartment, and 154 feet 6 inches by 185 feet at the bottom; the average depth is 12 feet. Its capacity is 6,000,000 gallons. The water is taken from the reservoir at three depths, namely, at the bottom, and also 6 and 10 feet up. The main is 10 inches in diameter, and the distributing-pipes run from 8 to 4 inches in diameter. The pipes are 5 feet below the surface. The pressure is about 80 lbs. There are $6\frac{36}{100}$ miles of pipe. All connection is made under the supervision of the company. The temperature of the water is from 45° to 48°. There are 50 hydrants and 5 houses connected. Analysis of the water is satisfactory in every way. The supply is one of exceptional purity, and no doubt will soon be extensively taken.

ELIZABETH.

Elizabeth has a population of 32,119. There are 4,960 houses in the city. The supply for this city is taken from the Elizabeth river, which has its origin in springs, and represents 9 miles of water-shed. The brook is dammed at a point three-fifths of a mile from the Pennsylvania railroad depot. The reservoir is a large one, having a capacity of 4,000,000 gallons. From this the water is carried by a pipe-line running along the river to the pumping station, which is near the Central railroad. The water reaches the station by gravity. At times there has been trouble with the water from turbidity, especially after heavy storms. To avoid this, a second reservoir was constructed 100 yards below the original one. While the water is clear No. 2 is allowed to fill, and thus, after storms, No. 2 becomes available. After the water in No. 1 has settled, the supply is again taken from it. In reservoir No. 2 there is a large charcoal filter, containing 5,000 cubic feet of charcoal, with which the water has at least three minutes' contact. This is to serve the double purpose of retaining the organic matter and that oxidation may take place. The filter does, to some extent, purify the water, yet it is difficult to ascertain how far it accomplishes it. The pipes are of cast iron, running from 16 inches in diameter to 4 inches. Over 2,000 houses are supplied. All connections are under the supervision of the company. The reservoirs are regularly cleaned. No. 1 being so arranged that by flood-gates the bottom can be cleansed, and also the amount flowing over the dam limited. Mr. Battin planned the works, and Mr. L. B. Battin is at present the Superintendent. The water has at times had taste, and also been quite roily, but frequent analyses reveal no dangerous qualities. Upon the whole, the supply is a good one.

EAST ORANGE.

East Orange has a population of 10,328. There are 1,605 houses. The works were commenced in 1882. The supply is owned by the East Orange Water Company. The water is obtained from 3 deep and 3 dug wells. The 3 deep wells are 90 feet in depth. The dug wells go to the rock-bed, then from 6 to 12 feet into the rock, and are then walled up. The wells are situated in a basin from which the water flows into Sunset pond and thence to the Passaic river. Nos. 1, 2 and 3 are the deep wells. Nos. 4, 5 and 6 are the dug wells. No. 4 yields 500,000 gallons in 24 hours. No. 5, 900,000 gallons. No. 6, 900,000 gallons. The dug wells are 50 feet in depth, and 26, 52 and 100 feet in diameter. The water is pumped from the wells simultaneously. The water in the wells stands from 4 to 5 feet higher than the water in the valley. The temperature of the water is 52 degrees. The estimated storage in the wells is over 2,000,000 gallons. The pressure varies from 50 to 70 pounds. There are 1,200 houses supplied in East Orange. The pipes vary from 12 to 4 inches in diameter. The supply is estimated to be sufficient for a city of 40,000 inhabitants. Analyses have been made, and the water is exceptionally pure and wholesome. The company also supply Bloomfield with water.

FLEMINGTON.

Flemington has a population of 1,909. There are 386 dwellings. The water-supply was introduced in 1859. It is owned by the Flemington Water Company. The source of supply was originally from springs exclusively; now, in addition, the South Branch is used, and also the well at the copper mine. The water is pumped direct to two reservoirs situated on Mullen hill, 70 feet above the town. These are made of brick; one is square and the other circular. Their combined capacity is 600,000 gallons. The water from the springs flows by gravity to the circular reservoir, and the water is pumped from the branch; there are 5 miles of pipe, running from 6 to 3 inches in diameter. The material is wrought iron. The water is filtered at the intake. One hundred and thirty-seven houses are connected with the supply. There are 9 hydrants. The consumption is 40,000 gallons per day. The water from the well in times of drought has a slight taste and is quite hard.

GLOUCESTER CITY.

Gloucester City has a population of 5,966. The number of houses is 1,137. The water-works were erected in 1883. There have been no additions. The supply was obtained from springs, which did not give a sufficient quantity, and it became necessary to use the Newton creek as the principal dependence. This receives the tide-water from the Delaware river. The water is pumped to a stand-pipe, which is 75 feet in height and 18 feet in diameter. Its capacity is 145,000 gallons. They can pump direct for fire purposes. There are from 9 to 10 miles of pipe, running from 16 to 4 inches in diameter. There are 467 taps and 66 hydrants. The ordinary pressure is 45 pounds. There are no meters used. The capacity is only limited by the capacity of the pumps. At least 1,000 houses use the water. Pipes are made of cast iron. Service-pipes are of lead and galvanized iron. Analysis made last year was satisfactory and was printed at the time.

HACKENSACK WATER COMPANY, RE-ORGANIZED.

This company supplies all that portion of northern New-Jersey lying north of Jersey City and between the Hackensack and Hudson rivers, northerly to the village of New Milford, on the Hackensack river, about five miles north of Hackensack. This district includes the city of Hoboken and the following towns and townships: West Hoboken, Weehawken, Union, Guttenberg, North Bergen, Fairview, Ridgefield, Hackensack, and Englewood, &c.

The total population supplied is about 75,000. About 6,000 houses are connected with the mains.

The works were designed by John F. Ward, C.E., and Chas. B. Brush, C.E. The additions were designed by Chas. B. Brush, C.E.

The works are owned by the Hackensack Water Company, Re-organized. The plant in Hoboken is owned by the city.

The source of supply is the Hackensack river at the village of New Milford. The area of the water-shed is about 100 square miles.

About half the water-shed is a rolling country with generally sandy soil. The balance, consisting of the lower range of the Highlands, is rocky, mountainous and precipitous. There are no large settlements of consequence within this drainage area, and the situation and surroundings are such as not to be favorable for suburban settlements or manufacturing industries.

There are two distributing reservoirs and three distributing tanks, all artificial. The water passes through all of these reservoirs and tanks for the different districts they supply, but all are arranged with by-passes, so the water may be pumped direct. All of the water is pumped.

The main reservoir is at Weehawken. Its capacity is 15,000,000 gallons; depth of water, 16 feet. The area of the water surface is 143,000 square feet. There is a reservoir at Hackensack of the capacity of 3,000,000 gallons, and a water surface of 34,000 square feet; depth of water, 13 feet. The tank in the high-service tower is covered. It has a capacity of 150,000 gallons, with a water surface of 700 square feet; depth of water, 30 feet. The tank for the Englewood distribution is practically a regulator to relieve the water-hammer on the pipes. It has a capacity of 5,000 gallons, and a water surface of 78 square feet; depth of water, 10 feet. The tank is covered. The tank for regulating supply to Shadyside is also covered. It has a capacity of about 2,000 gallons, and a water surface of 25 square feet; depth of water, 10 feet. In all these tanks and reservoirs the water enters on one side and passes out on the other side.

In each case the water is drawn from the bottom only, except in the case of the large reservoir, in which case it is drawn from the bottom and also from a point about two-thirds the depth of the water from the bottom. They are all thoroughly cleaned each year. No wells are used as a source of supply. There are about 75 miles of mains through which the water passes. There are about 5,750 taps and 450 fire hydrants on these mains.

The pressure varies in different parts of the district. The ordinary pressure is about 40 pounds and the fire pressure about 60 pounds.

About half the service-pipes are metered. All new consumers are metered in all districts, and all consumers are metered except some original consumers in Hoboken and Hackensack. There are no filters, but the water is aërated both at the pumping station at New Milford and the reservoir at Weehawken. The capacity of the plant will be, within a month or two, about 10,000,000 gallons per day, and the daily consumption is about 4,500,000 gallons per day. The mains are of cast iron and the service-pipes are of lead.

The water-supply does not receive sewage, drainage from factories, or other pollution. A few years ago there was trouble at certain seasons of the year, due to an excess of vegetation, commonly known as algæ. Since aëration of the water was introduced, there has been no further difficulty. Carp and black bass are carefully cultivated in the reservoirs, and they materially assist in keeping the water pure and sweet.

Analyses are made monthly of the water at different points by Prof. Albert R. Leeds, of the Stevens Institute, in Hoboken.

HACKETTSTOWN.

Hackettstown has a population of 2,645. There are 479 houses in the borough. The water-supply is obtained from several sources, located at different points, but all having origin in springs. One is situated in Morris county, 1 mile from the town, where a dam forms a reservoir, from which water flows by gravity through a ten-inch pipe to the town. There is at this reservoir a stone and charcoal filter, which has a beneficial effect. There are 10 miles of pipe, some of which are as small as 2 inches in diameter. This reservoir was cleaned in 1880. The yield from this is about 300,000 gallons. There are 2 other ponds known as Kings and Parks ponds, each using filter as in the other, and being upon the same principle. The former supplies the railroad company, and the latter supplies North Hackettstown. The town owns both of them. The water has no bad taste or smell, except occasionally, from the collection of leaves or from neglect of the ponds. The supply seems to give satisfaction.

HADDONFIELD.

Haddonfield has a population of 1,950. There are 402 houses. The works were erected in 1887. The supply is owned by the Haddonfield Water Company. Water is obtained from springs in a ravine 1½ miles from the town. The water is stored in a pond with a capacity of 2,000,000 gallons. From this it is pumped to a stand-pipe, which is 110 feet high and has a diameter of 15 feet. The capacity of the stand-pipe is 145,000 gallons. There are 3½ miles of iron pipe, running from 6 inches in diameter to 3 inches. There are 100 taps, which represent about the same number of houses supplied. There are a few meters used, and for others there is a regular schedule of prices. The pressure is from 40 to 50 pounds. The pumping capacity is 700,000 gallons per day. The supply does not equal this at present, but when necessity requires, it can be increased. The average daily consumption is 20,000 gallons. An analysis which has been made of the water is satisfactory. The water which comes down the stream after showers, and has a tendency to roil the water in the basin, is, by a recent arrangement, made to flow around the basin and away. Thus the supply is kept much clearer than formerly The number of those applying for connection is constantly increasing.

JERSEY CITY.

Jersey City has a population 153,312. There are 16,114 dwellings in the city. The water-works were built in 1854; Mr. John Ward was the engineer. The works are owned by the city. The source of supply is the Passaic river, and the water is taken from the river at a point near Belleville. The water is pumped from this point to a reservoir which has a capacity of 63,000,000 gallons. A portion of the supply is pumped direct; two-thirds of the supply passes through the reservoir. The water enters the reservoir at the top and is drawn from the bottom. It has only been necessary to clean the reservoir once in fifteen years.

The number of feet of pipe of the different sizes is as follows: Three-inch, 6,108; four-inch, 31,492; eight-inch, 45,604; ten-inch, 16,859; twelve-inch, 45,037; sixteen-inch, 27,071; twenty-inch, 66,232; twenty-four-inch, 12,214; twenty-six-inch, 3,500; thirty-six-inch, 39,971. The pipes are of cast iron and cement. There are, necessarily, many dead ends. There are 16,936 taps and 1,490 hydrants. The pressure is from 15 to 50 pounds. The water is supplied on a system of meters and by schedule. There are no filters. The capacity is 22,000,000 gallons. The average consumption is 17,000,000 gallons per day. Analyses of the water are made monthly by Messrs. Austen and Wilber, but these are not printed. The water has, at times, been severely criticised, and the question of its potability is under discussion. The introduction of some new supply is contemplated. The sources of pollution are the factories and cities along the Passaic, above the intake. The city supplies water to Bayonne, Harrison and Kearny.

LAKEWOOD.

Lakewood has a population of 1,000; this varies much with the season of the year. The number of houses is not estimated. The works were built in 1886. They were designed by Mr. Herring. The Lakewood Water Company are the owners. The source of supply is the Metedeconk river. The soil is sandy. The water is pumped direct, into a stand-pipe, which is 20 feet in diameter and 64 feet in height. There are two and three-quarter miles of pipe. The pipes are of cast iron, ranging in size from 8 to 4 inches. There are 35 taps and 10 hydrants. The ordinary pressure is 45 pounds. The water is supplied upon a schedule and by contract. There is a brass filter at the intake. The capacity is 1,000,000 gallons. The consumption varies from 70,000 to 100,000 gallons. The company own two miles up the stream for protection. Analysis which has been made of the water is on file. The system is an entire loop system throughout. The water has some color, but as it is used almost entirely for other purposes than drinking, this has no deleterious effect.

LAMBERTVILLE.

Lambertville has a population of 4,067. There are 969 houses in the city. The water-supply was owned by a company, under an old charter. Introduced under present control in 1877. The water is taken from Swan creek, at a point 1½ miles from the city. There are two reservoirs. No. 1 has a capacity of 6,975,000 gallons. No. 2 has a capacity of 17,000,000 gallons. The water flows by gravity to the city. The pressure is from 40 to 60 pounds. The main is 8 inches in diameter. The laterals are from 6 to 4 inches in diameter. Lead pipe is used for close connections. All connections are made under the supervision of the company. The dead ends are flushed every day in summer. The reservoirs are cleaned whenever necessary. The hydrants are placed one-fourth of a mile apart. There are 220 houses using the supply. There is at times in certain seasons a slight taste and odor. This has been carefully examined by the company, and a report by Mr. Cochran tends to show that it is almost entirely due to stagnation and lack of aëration, and he suggests as a remedy the aëration of the water and the use of a filter which shall cause precipitation by the use of alum. The water is systematically examined, and, with the exception of a few days in each year, is very satisfactory.

LONG BRANCH.

Long Branch has a population of 5,140. This does not include the large summer population. There are 1,015 houses in the city. The water-supply is owned and controlled by the Long Branch Water Company. It was introduced in 1887. The source of supply is the Cranbury or Whalepond creek. The reservoirs are two in number. Five thousand cubic yards of earth were taken from them. The bottom is covered with gravel and broken stone. The capacity of these is 1,500,000 gallons. The water flows from 7 miles of country above the works, through yellow sand. There are peat and iron deposits at the source. These only produce an effect after storms or during freshets. The flow of the stream is estimated to be 5,000,000 gallons. The water is pumped to a stand-pipe at West End, which is 18 feet in diameter and 75 in height, with a base 10 feet high. The stand-pipe is 110 feet above tide-water. The capacity of the stand-pipe is 143,000 gallons. The water is filtered through a stone filter before entering the reservoir. There are 25 miles of pipe, running from 20 inches in diameter to 4 inches. Seven hundred houses are connected with the supply. There are no meters used. The largest consumption recorded was July 14th, 1887, when 1,822;000 gallons were used. The smallest consumption was February 12th, 1887, when only 99,000 gallons were used. The pressure in Long Branch is 37 pounds. The pipe system has but few dead ends, and in summer the watering-carts take from these, and thus keep the water from stagnating. The water was examined by Prof. Leeds and pronounced satisfactory, with the exception of the taste and discoloration. To overcome these difficulties and make the water agreeable as well as wholesome, during the past summer eight large Hyatt filters have been introduced, having a daily capacity of 2,000,000 gallons. These have proved very satisfactory, and a decided change for the better has taken place. It is also proposed to introduce some method of aëration. The company supply the following places: Long Branch, West End, Elberon, Monmouth Beach, Seabright and Highland Beach.

MERCHANTVILLE.

Merchantville has a population of 741. There are 131 houses in the town. The water-works are owned by a private company. The supply was introduced in February, 1887. The water is taken from springs on a side hill, near the west branch of the Pensauken creek. This is about 2 miles from the town. There are 13 springs flowing into the receiving basin. This basin is 120 feet in length by 60 in breadth, and has a depth of 14 feet. The water is pumped from this point to a stand-pipe situated in the public square. The stand-pipe is 8 feet in diameter, and 100 feet high. It has a capacity of 40,000 gallons. The pressure is 43 pounds. There are 27 hydrants and 159 taps, representing 200 houses. There are 8 miles of cast-iron pipe, running from 8 to 4 inches in diameter.

The winter consumption per day is 20,000 gallons. The summer consumption per day is 126,000 gallons. The supply can be increased by using the spring-run adjacent to the receiving basin; and an examination of this in a dry season shows that 400,000 gallons per day can be added to the present supply; also, if necessary, the creek may become available, as chemical examination shows the water in it to be good for all purposes. In fact, all available waters near the present supply have been examined with reference to future needs. Analysis of the present supply is very satisfactory. At times, in summer, there is a slight taste from vegetable matter, but this is infrequent and of short duration. The water is soft and pleasant, and gives apparent satisfaction.

MONTCLAIR.

Montclair has a population of 6,327. There are 986 houses in the township. The procuring of an adequate and satisfactory water-supply has been under consideration for a long time, and in 1886 the work began, and has nearly reached completion. The plant belongs to a syndicate called the Montclair Water Company. The source of supply is a well located 325 feet north of Watchung avenue, and about 600 feet west of the valley road. The company owns three and three-quarters acres. The well is 2,400 feet from the top of the mountain; it is 1,600 feet from Harrison spring, which has a yield of 100,000 gallons per day. The pumping station is 315 feet above tide-water. The well does not affect the spring, but the water-level in the wells north of the city is lowered. The engineer is Mr. Chas. Brush. The capacity of the well is 500,000 gallons. At first a test well, 4 inches in diameter, was sunk; water was found at a depth of 56 feet, and it rose to within one foot of the surface; a pump was attached to this well, and 149,000 gallons pumped from it in 48 hours, and the water was lowered in the pipe 11 feet; 23 minutes after the pumping stopped, the water returned to within 18 inches of the surface; this being satisfactory, the permanent well has been dug 30 feet in diameter and 51 feet in depth; at this point its yielding power began to diminish, and 5 five-inch drills were made to an average depth of 45 feet; from these the water flowed so rapidly that it was necessary to plug the opening; it is now estimated that 250,000 gallons are flowing daily. There is to be, for the present, but one well. The pipes extend over 22 miles, and run from 12 inches in diameter to 4 inches. The greatest care has been used in the selection of all materials. The well is to be covered and ventilated. There are 2,000 applicants for the supply. The temperature of the water is 50°. The water is pumped to a reservoir 638 feet above tide-water. There is an iron tank; it has a capacity of 500,000 gallons. Chemical examination of the water is very satisfactory. The ground around the well has a bed of clay, varying in depth from 6 to 12 feet, and as the well is walled above the ground surface, this acts as an impermeable layer, so that the well can receive no surface-water. The work has all been carefully planned and carried to completion, and the supply should certainly prove satisfactory.

MOORESTOWN.

The works are being finished this year—1888. The supply is owned by a private company. The water is obtained from springs a little over a mile southwest of the town. There was formerly at this point a pond. This has been dredged out. It has a sand bottom. It has a capacity of 2,000,000 gallons. The water is pumped to a tank on the easterly end of Main street. This is placed on a tower 45 feet high and 24 feet across. The tank is made of cedar, and is 22 feet in diameter and 25 feet high. Its capacity is 75,000 gallons. The water can be pumped direct for fire purposes. The pressure is from 50 to 60 pounds. There are from 6 to 7 miles of pipe, made of alternate layers of iron and cement. The sizes used are from 10 to 4 inches. The pipes are tested at 600 pounds pressure. The system is arranged so that there will be few dead ends.

An analysis which has been made is satisfactory. There have been already 70 applications, and there will be 50 hydrants supplying water to the city.

MILLVILLE.

Millville has a population of 8,824. There are in the city 1,804 dwellings. The water-supply was introduced in 1879. The supply is owned by the Millville Water Company. The water is taken from the Maurice river, and also from a dug well 15 feet in diameter and 16 feet in depth. The water is pumped to a stand-pipe 12 feet in diameter and 128 in height. The water is pumped by a steam-pump, and a turbine wheel is also used. The stand-pipe is located at the head of Columbia avenue. The consumption is 500,000 gallons per day. The people of the city depend to a large extent upon dug wells for their drinking-water. Not over 10 per cent. of the houses avail themselves of the public supply. The pipes are of cast iron, running from 12 to 4 inches in diameter. The system is well looped. The pressure is from 45 to 55 pounds. The company make the taps and carry the pipes to the curb. Some meters are used. There are no known pollutions of the supply. There is, at times, during the summer, a slight taste to the water. The noticeable feature in this supply is the fact that so few take it. Although the well-water is said to be exceptionally good, nevertheless there is danger that in the future, with the rapid growth of the city and no provision for the sewage, there may occur a general contamination of the wells.

MOUNT HOLLY.

Mount Holly has a population of 5,006. There are 1,101 houses in the township. The charter for the water company is dated 1845. The water is taken from the north branch of the Rancocas creek. A dam separates the water-supply from the tide-water. The water is pumped from the basin to a reservoir situated on Mount Holly; this is 100 by 50 feet, by 15 feet in depth. It is divided into two basins. Its capacity is 600,000 gallons. The water enters the bottom, and is taken from a point 2 feet higher. There are 4 filters at the intake. The consumption is 191,626 gallons per day; 475 houses use the water. There are 29 hydrants. The pressure is from 35 to 40 pounds. There are 8 miles of pipe, running from 6 to 3 inches in diameter. The water has a color from the cedar swamps, and the taste usually found in such water. There was a contamination of the supply at

Smithville, which has been stopped. The only objectionable feature at present is the tendency to a deposit of fine mud at the intake. This can, and probably will, be overcome in the future. The company is now arranging to change the point of intake.

MORRISTOWN.

Morristown has a population of 8,760. The number of houses is 1,308. The charter for the company dates back to 1800; John Doughty and associates held the original charter; additions and changes have been made from time to time, and also changes in ownership; it now belongs to 12 individuals. The supply is spring-water from three different sources, located within 1½ miles of the public square—one is on the Mendham road, one on the Jockey Hollow road, and the third on the Baskingridge road. The soil in this section is gravelly. The water is supplied by gravity, except from the sand spring on the Baskingridge road, which is pumped to the mains running from the other springs. There are two collecting reservoirs on the Mendham road, and one on the Jockey Hollow road. The distributing reservoir is situated in the town; the estimated capacity is 650,000 barrels. The pipes run from 10 inches in diameter to 3 inches; they are made of cast iron. There are 700 taps. There are 61 hydrants and cisterns. The pressure varies with locality, from 40 to 60 pounds. The water is supplied to consumers both on a schedule and by meters. Seven hundred and fifty-six houses use the water. Capacity is 75,000 gallons per day. The service-pipes are of lead and galvanized iron. There has been, at times, a fishy taste, but an analysis made by Profs. Leeds and Chandler shows that this was due to vegetable matter in the reservoir, and the analysis also revealed the fact that the water was a pure spring-water, exceptionally free from impurities.

NEWARK.

Newark has a population of 152,988. There are 19,467 dwelling-houses. The supply is taken from the Passaic river near Belleville. The present works were erected from 1867 to 1869. Prior to this the water was taken from springs, from 1860 to 1869, and also partly from the Morris canal. The original charter dates back to 1800. The water is pumped to 3 reservoirs. The Belleville reservoir has an elevation of 165 feet, and is 400 by 280 feet. Its capacity is

14,000,000 gallons. The low-service reservoir is in the city. Its elevation is 114 feet. It is circular, and 450 feet in diameter. Its capacity is 21,000,000 gallons. This reservoir is only filled to an elevation of 107 feet, with a capacity of 14,000,000 gallons. The high-service reservoir is also in the city. Its elevation is 223 feet. It is 300 feet by 25, and its capacity is 9,000,000 gallons. There are $160\frac{4169}{5280}$ miles of pipe, running from 3 to 30 inches. There are 1,341 hydrants. The highest average monthly consumption in 1887 was 14,295,582. The lowest average monthly consumption in 1887 was 10,884,097. The pressure at Belleville level is from 20 to 33 pounds. The pressure at low service is 20 to 37 pounds. The pressure at high service is 30 to 80 pounds. The pressure at special high service is 30 to 50 pounds. Belleville is supplied from the same source. The question of the quality of the Newark water-supply has been and still is under discussion. (See article in last report.)

NEW BRUNSWICK.

New Brunswick has a population of 18,258. There are 2,732 houses. The works were constructed in 1868. Since 1873 they have been owned by the city. Before that date a company had control. The water is taken from Weston's pond, which receives its supply from Lawrence brook. The area of the water-shed represented is 40 square miles. The water is pumped to a reservoir, which is constructed in the form of a square, 300 feet each way, at the top, and 240 feet at the bottom. There are 2 basins, each of the size mentioned. The bottom is puddled. The capacity is 14,000,000 gallons. There are 25 miles of pipe, some of which are of cast iron, others of wrought iron and cement. The main is 16 inches in diameter. There are 1,813 permits issued. There are 176 hydrants. The average pressure is 35 pounds. Prices are determined by meters and by schedule. Limit of pumping capacity is 3,000,000 gallons per day. The average consumption is 1,083,000 gallons per day. Seventeen hundred houses are connected with the water-supply. The pipes run from 12 to 4 inches in diameter. The Milltown factories are on the line of the stream, and Parsons' snuff mills. At certain times in summer, after there has been drought, followed by rains, the water has a bad taste and smell. Analyses have been made, and are on record. The reservoir is regularly cleaned each year, and care is used to prevent any stagnation of water at dead ends.

OCEAN GROVE.

Ocean Grove has a population of 1,177; this is changed in summer by an increase to 30,000. The number of houses is 293. The water-works were constructed in 1882, under the supervision of Mr. H. C. Safford. The water-supply is owned by the Association. The water is obtained from artesian wells; there are in all, 14 wells, 2 of which have been abandoned; the wells are 4 inches in diameter; the average depth of the wells is 425 feet. The water is pumped to a stand-pipe; this is placed on a structure which is 5 feet in height. The reservoir itself is 30 feet in height and 35 feet in diameter. The intention is, at present, to raise the whole structure 25 or 30 feet; this reservoir is merely for storage and pressure; it is situated at the end of the loop system farthest from the pumping station, and what is not used during the day is stored, and returns to the pipes when the pumping is stopped. There are 10 miles of pipe. There are 534 taps, and 40 hydrants. The pressure is 40 pounds. There are some meters in use. The capacity is 550 gallons per minute. The daily summer consumption is 300,000 gallons. West Grove is also supplied from same source. Prof. Cook has made an analysis, which is in print. The water is pure, soft and sparkling, and gives general satisfaction.

ORANGE.

Orange has a population of 15,231. There are 2,177 houses. Works were constructed in 1882. They were designed by Mr. W. B. Rider. There have been no additions. They are owned by the city. The source of supply is the west branch of the Rahway river. The area of the water-shed is 5 square miles. The water is supplied by gravity. A reservoir has been made by building a dam across the valley. One hundred and sixty-five hundredths acres are used for reservoir purposes. The reservoir will hold 273,955,654 gallons. There is a gate in the middle of the dam, and an overflow at one end. There are 35 miles of pipe. The main is 20 inches in diameter. There are 1,027 taps. The price of the water is regulated by meters and by schedule. The capacity is unlimited. The consumption is not estimated. There are 1,200 consumers. One-third of the population are estimated as using the supply. It is supplied to a few private individuals outside. The supply is only polluted by surface drainage. In summer and in certain sections, water standing in mains and at dead ends becomes bad, by reason of the decomposition of vegetable matter. It has both a bad taste and smell. But the water, as it enters the main, is always palatable, showing that stagnation is the principal cause of the trouble. The system has also many dead ends, which tend to increase this. Analyses have been made, but they are not in print.

PASSAIC.

Passaic has a population of 8,326. There are 1,087 houses in the city. The water-supply is controlled by a private company. The water was introduced in 1862. The source was formerly the Passaic river. It has now been changed to Vreeland lake, which is fed by springs. This change was made April 30th, 1888. The water is pumped to a reservoir located 1 mile southwest of the pumping station. Its size is 75 by 125 feet. It is oval, and has a puddled bottom. Its capacity is 700,000 gallons. The water is taken from the reservoir at two points on opposite sides. The pipes are of cement, and some of iron. They run from 4 to 12 inches in diameter. They extend over between 11 and 12 miles. There are 103 hydrants, and 375 houses are supplied. The average consumption is 500,000 gallons. Analyses have been made from time to time. The water, in summer, shows the effect of vegetation. With this exception, which only occurs infrequently, the water is satisfactory.

PATERSON.

Paterson has a population of 63,273. There are 8,386 houses in the city. The water-supply was introduced in 1856. The source of supply is the Passaic river. The water is pumped to four reservoirs —No. 1 has a capacity of 25,000,000 gallons; No. 2, 12,000,000 gallons; No. 3, 8,000,000 gallons; No. 4, 3,000,000 gallons. These reservoirs are situated near the river. There is a thorough circulation of the water in them. There are 5,250 houses supplied with the water. There are 681 fire-hydrants. The pipes are of cast iron, lined with cement, and they extend over 70 miles. They vary in size from 36 to 4 inches in diameter. The pressure is from 35 to 45 pounds. Analyses have been satisfactory. At times, the water is roily and has a taste due to vegetable matter.

PENNINGTON.

The supply was introduced in 1887. The source of supply is from a spring 2 miles away, situated on the Golden property. The reservoir is 80 feet in diameter, and has a crib in the middle, 16 by 20 by 20. The supply-pipe enters at a depth of 10 feet above the bottom of the crib. The soil is a clay loam and coarse, broken earth. The pipe is 4 inches in diameter. There are 2½ miles of pipe. Forty-two families and the Pennington Seminary use the water. The water flows by gravity, and the pressure is 20 pounds. A spring 150 feet above the one mentioned, flows into the reservoir. The supply belongs to a private company. The consumption in summer, averages 2,800 gallons per day. The water is soft, and the analysis is in every way satisfactory.

PERTH AMBOY.

Perth Amboy has a population of 6,311. The number of houses is 921. The water-works were completed in 1883. Mr. George Inman was the engineer. The supply is owned by a private company. The supply is derived from the Englewood brook, which is dammed to secure pondage. The supply represents surface and ground-water only. The pond holds 160,000,000 gallons. The water is pumped from the pond to a stand-pipe, which is 71 feet 10 inches in height, and is 20 feet in diameter; it has a capacity of 176,000 gallons. The water secured represents 2½ miles of water-shed. The water is never allowed to get lower than 5 days' consumption, but to do this, it is necessary, at times, to limit consumption. There are 7 miles of pipe, which vary in size from 12 to 4 inches in diameter. The pipes have an average depth of 3½ feet. The average pressure is 42 pounds. The daily pumpage is 350,000 gallons. There are 150 house connections. The water was examined when introduced, and was then said to be a good water for domestic use. The water is often roily, and has an unpleasant taste. The supply is inadequate, and not of the best. In all probability, some new supply will have to be obtained in the near future.

PHILLIPSBURG.

Phillipsburg has a population of 8,058. There are 1,690 houses. The water-works were commenced in 1886, and finished in 1887.

The supply is obtained from a well near the Delaware river. The supply is owned by a private company. The plant is 1 mile above the town. The well is 49 feet deep; this is connected with another well by a twenty-inch pipe, and the second well is arranged so that, if necessary, the water can be let in from the river, but thus far the well has given an abundant supply. The water is pumped to a reservoir with a capacity of 2,000,000 gallons. There are 6 or 7 miles of cast-iron pipe, varying in size from 14 to 4 inches in diameter. There are 300 houses supplied, and 65 hydrants. The water, by analysis, is pure, but quite hard. Those who do not take the public supply, depend upon cisterns. There is but one well in use in the town. The reason for this lies in the fact that the city is located on a bluff, and it is almost impossible to obtain water from wells.

PRINCETON.

Princeton has a population of 4,577; this is increased by the number of students in the College and Seminary. There are 883 houses in the township. The works were completed in 1883, and are controlled by a private company. The water is obtained from a natural filter-bed, 1½ miles from the borough, and on the north side of Stony brook, in the bottom-lands. The water is taken from a well 25 feet in diameter, with the masonry carried above the freshet level; this well can receive no contamination from above, as the surface of the ground surrounding it is covered with an impermeable layer of clay. The water is pumped through a ten-inch main to a stand-pipe 150 feet high, and 250 feet above the source. It has a capacity of 142,000 gallons. The lateral pipes are 6 and 4 inches in diameter. There are 212 houses supplied, in addition to the college buildings. The yield is estimated at 90,000,000 gallons. The pressure is from 50 to 80 pounds. The consumption is from 40,000 to 50,000 gallons per day. Analyses are satisfactory. The water is moderately hard. The residents are rapidly availing themselves of the supply.

RAHWAY.

Rahway has a population of 6,861. There are 1,345 houses in the city. The works were built in 1871, and are owned by the city. The water is taken from the Rahway river. The water flows from the river into a well, and thence is pumped directly into the mains. The tide-water does not set back as far as the works. The works are located at Bechler's hill. The water is filtered at the intake. The pipes are cement-lined, and vary in size from 12 to 4 inches in diameter. The whole system is flushed twice a year. Six hundred houses and factories are supplied. There are 123 hydrants. The average consumption is 721,000 gallons per day. There has been trouble in the past during freshets and drought by reason of the discoloration and bad taste. This is difficult to overcome, as the stream is quite shallow and receives large surface drainage. An analysis made three years ago revealed no detrimental qualities.

RED BANK.

Red Bank has a population of 3,186. The number of houses is 573. The water-works were completed in 1884. The water-supply is obtained from a dug well 62 feet deep and 20 feet in diameter. Six eight-inch pipes were driven 10 feet below the bottom of this well, as it was found that the large well could be sunk no deeper without danger. Since the first well, there have been 12 driven wells put down near the original well, varying in depth from 80 to 150 feet. The reservoir is situated on Borden's hill. It is oval in form. It has a capacity of 60,000 gallons. The system is looped as much as possible. There are from 3 to 4 miles of cast pipe, running from 10 to 4 inches. There are but few dead ends. The number of houses supplied is 150. The number of hydrants is 70. The pressure varies from 40 to 50 pounds. Pump daily, 100,000 gallons. The capacity of large well is 250,000 gallons per day. The estimated capacity of all wells combined is 600,000. Analysis has been made by Prof. Cook. The water is pure and soft, and has given general satisfaction.

SALEM.

Salem has a population of 5,516. There are in the city 1,291 dwellings. The water-supply was introduced in 1882. The plant is owned by the city. The water is obtained from a stream (Quinton's creek) and a well. The well is 20 feet in diameter and has a depth of 33 feet. The supply station is 3 miles from the town. The water is pumped direct. The number of houses supplied is 350. There are a few houses outside of the city limits which are connected with the supply. There are 8½ miles of iron pipe, running in size from 12 to 4 inches in diameter. There is no known pollution of the supply. The water has taste at times, especially during drought. The pond has a capacity of 55,000,000 gallons, and the average daily consumption is 450,000 gallons. The pipes are thoroughly flushed every week. The water from the well is quite hard. The commingling of the water from the well and from the pond has not improved the water very perceptibly. Analysis has been made of the well-water, but not of the pond-water. The average pressure is from 45 to 50 pounds. The supply should be improved by some method which will overcome the disagreeable taste.

SOMERVILLE.

Somerville has a population of 3,316. There are 621 houses. The water-supply was introduced in 1882, and is owned by a private company. The source of supply is the Raritan river. The water is taken from the stream at Raritan. The reservoir is a stand-pipe 150 feet high and a diameter of 10 feet. The capacity is 88,077 gallons. The intake is in the middle of the river, where the water has a depth of 3 feet. In summer it sometimes is only 6 inches. There are in Somerville and Raritan 6 miles of pipe. The mains are 12 and 10 inches. Distributing-pipes, 4 inches. There are 275 houses using the supply. The daily consumption is 350,000 gallons. The water was formerly turbid and had some taste at times. Hyatt filters were introduced, and since that time the water has been pure and clear. The water now gives entire satisfaction at all times, and should be used by more families.

TRENTON.

The estimated population of the city at present is 60,000. The number of houses not estimated. The original charter is dated 1801, and the water was then derived from a spring. The city purchased the plant in 1859. The supply is now obtained from the Delaware river. The water is pumped to a reservoir situated near Pennington avenue. This is divided into three compartments. The water enters the middle of the reservoir and is taken from the ends. The reservoir is 100 feet above sea-level. It has a capacity of

20,000,000 gallons. The water at the pumping station is pumped from a well, and there is also a water-wheel in use, which pumps direct. The sizes of pipe vary from 4 inches to 16 inches for distributing, and the main is 36 inches in diameter. The system is well looped. There are 11,000 houses supplied. The pressure is about 30 pounds. There are some meters, and also the water is supplied by contract. The capacity is only limited by power of pumps. The consumption is 3,000,000 gallons per day. The supply is only affected by rains, which have a tendency to make the water cloudy.

VINELAND BOROUGH.

Population, 3,150. Estimated number of houses, 600. Water-supply by driven wells—number, 38. Introduced and owned by Charles Keightly. Introduced 1886. Taken by 275 houses. The wells go through alternate layers of clay and sand to an average depth of 50 feet. But one coupling of the pipe, about 20 feet down. The pipe is galvanized, of two-inch diameter, and over the holes at the joint is a brass wire gauze, to keep out coarse sand. The temperature of the water is 56°. The water rises in the pipes 34 to 35 feet without suction. Twenty-six of the wells are in a radius of 20 feet and the rest near. At first driving there was a supply of 60 gallons a minute from several wells within a seven-foot diameter. From 26 put in a twenty-foot diameter we get 110 gallons a minute. When we attach 12 that are outside we get 135 gallons a minute. No signs of decrease. Since the blizzard to April, when examination was made, water had risen 12 to 15 feet, and owner says that there is more water in the ground than in 20 years before. The surface around the wells is guarded, although the owner thinks there is no danger of contamination from the upper soil, by reason of the successive layers of tenacious clay before reaching the water-bearing strata. Water distributed to houses in iron pipes. Mains 10 inches. Tested with pressure of 300 pounds. House connections 3¼ inches, and made by plumbers. The quality of the water has been satisfactory. The wells were the private enterprise of an enterprising man, who does not seem very anxious to realize profit. Charges are reasonable, and he is willing and likely to make transfer to the borough or to a company at reasonable compensation.

WASHINGTON.

Washington has a population of 2,597. There are 556 houses in the borough. The water-supply, which is owned by a private company, was introduced in 1882. The supply comes from springs on Scott's mountain. The reservoir is situated at Roaring Rock. It is 250 feet above the level of the square in the borough. The water flows by gravity. The main is 10 inches in diameter. The pipes are of cast iron, of which there are 5 miles, the smallest used being 4 inches in diameter. There are 25 hydrants. The pressure is 52 pounds. There are a few meters used. Three hundred and twenty houses are connected. The dead ends, four in number, are regularly flushed. The water is very good and the supply is ample. No complaints have ever been made.

WENONAH.

Wenonah has a population of 487. There are 61 houses. The works were constructed in 1886. Designed by R. D. Wood & Co. The works are owned by a private company. The water is taken from a pond supplied by springs. The water is pumped from a well at the head of the pond. The surrounding soil is light and sandy. The pond covers about an acre. It was a natural basin and has a sand bottom. The water is pumped to a cedar tank, 25 feet in diameter and 16 feet high. This tank is upon a sixteen-foot trestle. The capacity is 60,000 gallons. There is 1 mile of pipe. There are 50 taps and 11 fire-plugs. The average pressure is 40 pounds. The price of the water is regulated by a schedule. Pipes vary in size from 6 to 2 inches. The winter consumption is 10,000 gallons per day, and that of the summer is 40,000 to 50,000 gallons for the same time. The system is well looped, and the water gives entire satisfaction.

WOODBURY.

Woodbury has a population of 3,278. There are 712 houses. The works were built in 1886–87. Designed by Carson & Murphy. There have been no additions. Works are owned by the city. The source of supply is the headwaters of Mantua creek, 4½ miles from town. This represents a large water-shed. Water originally comes from cedar swamps back of Glassboro, and also from three marl-beds. The water is pumped to a reservoir 1 mile out of town. The reservoir is 40 feet square and 14 feet in depth. It is divided into two compartments. The water enters the bottom of the reservoir at one end and is taken from the center of each compartment. The division embankment is 6 feet in height. There are 12 miles of pipe. Twelve-inch main. Three hundred and thirty-five permits have been issued. Pressure 30 to 55 pounds. Water is supplied on a schedule of prices. There are 59 hydrants. There is a single brass screen filter at the intake. The capacity is 500,000 gallons. The average consumption is 60,000 gallons. Three taps are supplied out of the city. The pipes are of cast iron. The small pipes run to 4 inches in diameter. The water is pleasant and soft. An analysis was made in 1885, and was printed in the engineer's report at that time.

DISEASES OF WORKERS IN TEXTILE GOODS.

BY J. W. STICKLER, M.D., AND F. B. LANE, ORANGE;
AND J. B. STUBBART, M. D., BLOOMFIELD.

INTRODUCTION BY SECRETARY.

(*Inquiries into State Industries, Continued from Previous Reports.*)

In previous reports this Board has given considerable attention to those industries of the State in which there is apt to be risk to the health of operatives. Experience long ago proved that it is not always safe to leave this matter to the intelligence and good intent of the employers, or to the good judgment of those employed. There are many industries that at best tend to impair health, and as to which we need to inform ourselves and to apply the best methods of relief. There are many others that can be pursued consistently with health, but which, by reason of improper modes of heating and imperfections of ventilation, constantly imperil the health of some of those employed. It is the high duty of the State to see to it that those upon whom it must depend for productive labor, are enabled to pursue that labor without undue peril to health and life. Hence, all machinery should be properly guarded, all factories should be examined by those expert in detecting the causes of ill health or undue exposure, and those of younger age should be protected from kinds and degrees of work unfavorable to full development and to proper schooling. While the laws of this State now provide for the inspection of factories, there are still many improvements to be made. So far as sanitary conditions are concerned, this should be under the surveillance of the State Board of Health. We cannot review the various foreign Blue-books and other State records, without seeing how wisely legislation has provided for such skilled Inspectors in most countries. The defect applying to the greatest number of indoor trades and occupations is that arising from imperfect modes of ventilation.

We quote some suggestions from a paper of Mr. William Tattershall, an excellent authority, read at the ninth meeting of the Sanitary Institute of Great Britain:

"VENTILATION OF FACTORIES AND WORKSHOPS.

"The construction of factories or rooms will govern the application of any system of ventilation to them. The ordinary method of ventilating weaving and other sheds has, I think, usually been inefficient by reason of the contrivances for exhausting the foul air being inadequate at their best and uncertain in action when most needed, and also because the inlets for fresh air were not under control as to the quantity, temperature or direction of the air admitted. The best results have been achieved by placing one or more exhaust ventilators near the center of shed roof and arranging the inlets at regular distances around the walls. The amount of air to be passed through will depend on the temperature and rate of pollution inside, and the inlets may, if needed, be carried down from the roof, and the entering air warmed, cooled or moistened at pleasure; there are plenty of appliances to be had by which air can be admitted without draft. A series of rooms one above the other may, if not too large, be dealt with by one exhaust ventilator, placed at the top of a vertical shaft extending through the several stories and with outlets from each room, the inlets for fresh air to each room being so arranged that the air may, in its course from inlet to outlet, traverse the room, and especially that part in which the greatest source of pollution exists. It is obvious that a series of small rooms on the same floor level may be dealt with in a similar way by a horizontal air duct with openings to each room and inlets as suggested above.

"In storied rooms too large to be dealt with in this manner, each room may be treated separately, and many large work-rooms are so treated, by having one or more exhaust-fans placed on one side of the room and fixed either to discharge through windows or openings specially made. The inlets in this case would be arranged on the opposite side of the room to the fan, and possibly at the ends, if required, so as to cause the current of air to traverse the sources of pollution, whether dust, heat, fumes or steam. Generally, the requisite effect in the removal of polluting matters is obtained by running the fans entirely free from any kind of tubes on the feed or room side; and where possible this is best, as less power is needed to drive them and more air is moved when the area of feed is unrestricted. There are, however, some cases in which it is necessary, and many in which it is advisable, to carry away polluting matters immediately they are set free, so as to prevent their distribution in the atmosphere. In these cases it becomes necessary to construct tubes with openings near the source of pollution and connected at the other or exit end with a fan, which, when working, produces a powerful exhaust and carries away the polluting matter as fast as it is produced. This arrangement may be and is applied with perfect success to remove dust, heat, steam and fumes of various kinds. The tubes may be carried overhead, underneath or level with the sources of pollution, and the impurities carried away may be dealt with in a chamber, so as to retain them and allow the air to escape pure."

The last two reports of the Chief Inspector of Factories and Workshops of Great Britain (1886 and 1887) contain some valuable suggestions.

Mr. Cromp thus speaks on the subject of ventilation:

"I am glad to be able to note an increase in my district during the past year, of the use of the 'Blackman air-propeller' for ventilating china-scouring rooms, fettling and polishing-shops, and flint-mixing and sifting-places in potteries, gassing-rooms in cotton factories, and vat-rooms in breweries.

"There is one simple and economical means of ventilation of upper rooms of factories which is nearly always satisfactory, and the adoption of which I have almost daily the opportunity of recommending, and which architects and builders seem to me to unaccountably neglect. I mean that of ventilating ridge-tiles on the ridge of roof. I enclose a page of designs of these tiles made at numerous tileries in this district. The cost is very little more than the ordinary ridge-tile which they replace; they effectually take away the foul air, and there is scarcely any trouble about draughts from this use. Any room at the top of a building may very easily be ventilated in this manner, especially if not ceiled; but if ceiled, it is easy to make a few holes in the ceiling, covered, if need be, with perforated zinc.

"I also enclose drawing showing Thompson's patent ventilating-ridge, made by Mr. Peake, of the Tileries, Tunstall, which, by a system of air-flues, ventilates all rooms in a building. It has the advantage of being very ornamental in appearance, and is said to be effective in use. As nearly all factories and workshops have a ridge, it may as well be a ventilating-ridge, and if all parts of the building are connected by air-flues with the roof, every part will be permanently and constantly ventilated by the exhaustion of foul air through the ridge-tiles. Whatever may be the direction of the wind, there is a constant current of air through this ridge, sucking out the foul air from below. Another advantage about this system of ventilation is that it cannot get out of order, requires no attention, and will last as long as the building lasts.

"Owing to the very simplicity and inexpensiveness of this efficient (ventilating ridge-tile) mode of ventilation, it is in danger of being overlooked, and I have, therefore, the greater pleasure in bringing it under your notice, and under that of architects, builders, and occupiers of factories and workshops.

"VENTILATING-RIDGES AND AIR-BRICKS.

"*Made in blue, red, and brown colors.*

"During the past year the system of electric lighting has been introduced into a brewery, flour mill, pottery, and an iron mill in my district, to say nothing of private houses and a church. Beyond its great utility as a mode of illumination, it has incidental advantages in reducing risk of fire and explosion, and in keeping the atmosphere pure, instead of fouling it with the products of combustion. In the case of flour mills, its use is of especial service in those respects, and in reducing the oppressive heat.

"Even under the most perfect system of ventilation, and after every effort is made to insure cleanliness, there are still some manufacturing processes which are more or less injurious to health owing to the inhalation of dust. Of these I may mention china-scouring, earthenware-polishing, and majolica-painting in potteries, and work in flour mills and rag-sorting places.

"I have tried hard to overcome the prejudice of the workers against the use of respirators, but with very little success. The 'Nose and Mouth Protector' made by Squire, of Oxford street, London, and shown in the Health Exhibition, is very cheap and effective. At a cotton mill I found some women put to the work of printing labels and wrappers, and two of them using bronze powder in a most reckless manner, without any knowledge of its danger. They complained of headache and sickness, and no wonder. I recommended Squire's respirators, which they have worn for twelve months without discomfort and with freedom from headache or sickness."

A similar respirator is manufactured in this country, known as the Hurd Patent Respirator (Morley Respirator Co., East Saginaw, Mich.) We have known them used with advantage.

There are some factories in which the system of ventilation described by Dr. I. G. Pinkham is as applicable and economical as for school-houses. See, in full, article "The Ventilation of School-Rooms Heated by Stoves." (Massachusetts Report of Board of Health, 1887.)

The subject to which we give especial attention this year is "*Diseases of Workers in Textile Goods*," as studied by J. W. Stickler, M.D., and F. B. Lane, of Orange, and J. E. Stubbart, of Bloomfield.

DISEASES OF WORKERS IN TEXTILE GOODS.

We will consider (1) the various processes of manufacture; (2) the hygienic condition of the rooms in which the operators work; (3) the physical condition of the employes, and then present some ideas as to apparatus which might be used for the removal of the dust-fibers, vapors and gases which pervade certain departments. Let us begin with the various processes of manufacture in

WOOLEN GOODS.

The wool comes to the factory in large bales, and is taken to the sorting-room and placed upon tables, where it is sorted over and graded. The temperature in this room is from 75° to 80° F. There is but little dust-fiber in this department.

From the sorting-room it is taken to the scouring-room. In scouring, solutions of soda-ash, sålt and other alkalies are used. From the scourers it goes to the dyers, and is submitted to a bath of indigo, logwood and other coloring substances in solution. Next, the wool is taken to the drying-rooms and placed upon racks, hot air from steam-pipe coils being the drying agent.

The next step is that of "picking." This is accomplished in the following manner: The wool is first saturated with an emulsion of lard oil and water, then it is put into a cleaning or burring machine, by which burs and other foreign substances are separated from the wool-fibers.

It might be in place here to mention that in the process of manufacture of coarse yarns for a coarse grade of blankets, South American wool is used, and it contains a large amount of lime, which is used to remove the wool from the pelts. The wool, instead of being scoured, is sent direct from the sorting-room to the picking-room, and without being subject to the emulsion of oil, it is put through the burring-machine. This part of the work is very dusty and irritating to the air-passages, of which mention will be made.

The next in order is the "carding." The wool is placed in the carding machine, and is subject to the combing process (as it is termed). It is treated by coarse, fine and finishing combs, and run on long spools, and is then carried to the spinning-room, to be spun on bobbins of various lengths. The bobbins are then taken to the warping-room, and the long fibers of wool changed from the bobbins to large spools. They are passed in turn through the warping machine, and treated with glue, on the way, and then passed over heating-drums to large rollers.

The next room is the weaving, from which the cloth goes to the finishing-room, to be put through the fulling process, or "raising the nap" (as it is called), which is done by passing the cloth on rollers swiftly over the points of teasels, or fullers' plant, as it is termed.

The cloths or blankets are then ready to be trimmed and shipped.

This constitutes a brief description of the processes of manufacture in the different departments.

We will now consider briefly the hygienic condition of the sorting and picking-rooms.

These rooms, as a rule, are large, well lighted, comfortably heated and generally furnished with ventilators. An exception to this was found in a "shoddy factory" which I visited. The ceilings were low, with no system of ventilation; a thick dust pervaded the atmosphere, and the rag-sorters (mostly Italian women) all showed evidence of nasal and bronchial irritation; in some cases the nose was sore and the anterior nares seemed almost plugged with dirt and dust-fiber. A system of ventilation, and the use of exhaust-fans, for the removal of the dust-fiber, ought to be used, which would add greatly to the comfort and health of the employes.

Let us examine into the physical condition of the employes in these departments.

No. 1. Aged 23; 4 years in business; no catarrh or bronchitis; health good; uses beer and tobacco.

No. 2. Aged 19; 2 years in business; health good; never was ill; uses beer.

No. 3. Aged 29; 6 years in business; has catarrh; takes cold easily; thinks his work aggravates the catarrh; uses tobacco.

No. 4. Aged 48; 13 years in business; health good; uses beer and tobacco.

No. 5. Aged 28; 9 years in business; no catarrh; has had malarial fever; is well now; uses tobacco.

No. 6. Aged 31; 5 years in business; health good; never was ill; uses beer and tobacco.

No. 7. Aged 28; 7 years in business; no catarrh or bronchitis; good health; uses beer and tobacco.

No. 8. Aged 30; 6 years in business; has had nasal catarrh a little; attributed it to taking cold; health good; uses sponge to protect mouth and nose while picking the dry wool; uses beer and tobacco.

The Superintendent, who has been in the manufacture of woolen goods for fifty-nine years, told me he considered the picking-room, where the coarse foreign wools were sent dry to the pickers, the most injurious to health of any of the departments, and was free to confess that any one with weak respiratory organs should not be employed in this department. Only eight men were employed in this department, as a few men will take care of a large amount of wool. We learn from these statements that of eight employes two have had catarrh, of which one does not attribute it to his work; one has had malarial fever, but is in good health now, while the rest have had good health. Six use tobacco and stimulants.

The next rooms to be hygienically considered are the scouring and drying-rooms. The conclusions any one would draw as to the probable effect of the various kinds of exposure upon the health of the men who work in these rooms, from what you see when you first enter the apartments, would be that men cannot long endure such treatment without having their health impaired. The atmosphere is loaded with dense steam and gases from the dye-tubs, the floors are wet, and all the timbers and machinery are dripping with water. Theoretically, we should have here congested pulmonary capillaries, tendency to pneumonia, bronchitis, rheumatism and allied affections. Let us hear what the men say, without getting the detailed interview with each one separately. I will give a statement of their report.

Out of 18 dyers interviewed, only 3 report rheumatism, 1 catarrh, 1 has had malaria, 13 report that their health has not been affected by their occupation. Fourteen use tobacco and stimulants.

Undoubtedly, where we have so dense a vapor, we will get some capillary congestion without the naturally looked-for morbid processes following. We also find evidence of some rheumatic trouble, but not to that degree we would expect where the men are exposed continually to the moist heat of these departments.

The next departments to be considered hygienically are the carding, spinning and weaving-rooms. We will consider them collectively, as they are very similar in their surroundings. We find them well lighted, heated, and, to some extent, ventilated. There is comparatively little dust in these rooms, the wool being so thoroughly saturated with oil that it holds the wool-fiber intact; the only place I found any was in the manufacture of coarse yarns, from the coarse foreign wools. There is a fine dust-fiber, which is termed by the men, "dead hair." It does not take the oil, and is found floating in the atmosphere to a limited extent.

Let us now consider the physical condition of the employes. Out of 50 operatives questioned in their different departments, only 2 had catarrh, 2 bronchial irritation, 1 rheumatism, 2 malaria, 44 expressed themselves as enjoying good health, and considered their occupation a healthy one. Twenty-four use tobacco and stimulants. We might expect to find more disease than is here shown to exist, but careful investigation does not bring it out.

From the weave-room, the cloth passes to the "gigging" or "fulling" machine, and from that to the finishing and packing departments, of which further mention need not be made.

Out of 76 workers in woolen goods, only 5 have catarrh, 4 rheumatism, 1 bronchitis, 4 malaria. Forty-four use tobacco and beer. I would liked to have furnished a larger list of employes interviewed, and also present tables showing the death-rates and cause of death in the factories, but was unable to get them. It was only after much effort that I could get the facts. Dr. Stubbert, fortunately, was more successful, and I append the following tables from him.

"The mill of Thos. Oakes & Co. employs about 150 hands, and shows, for the past ten years, a mortality of four per cent., or a total of six deaths. The causes of death were: Bright's disease, 1, aged 53; apoplexy, 2, ages 62 and 74; heart disease, 1, aged 55; accident, 1, aged 19; suicide, 1, aged 71. Not one of these deaths occurred from lesions contracted in the mills.

"The appended table includes records of hands from the

Mills of Thomas Oakes & Co., in Bloomfield, and of Mr. Underhill, in Franklin.

Number.	Sex.	Age at entering mill.	Present age.	Number of years in mill.	Diseases inherited or acquired before entering mill.	Diseases acquired since entering mill.	Use of alcohol or tobacco.
1	Male	19	22	3			Tobacco.
2	"	8	23	15			Tobacco.
3	"	26	33	7			Lager.
4	"	47	50	3			Tobacco.
5	"	18	24	6			Tobacco.
6	"	17	17				
7	"	35	38	3			Tobacco.
8	"	24	28	4			Tobacco.
9	"	29	45	16			
10	"	40	58	18			
11	"	23	51	28			
12	"	24	26	2			Tobacco.
13	"	14	15	1			
14	"	15	15				
15	"	15	17	2			Tobacco.
16	"	45	47	2			Tobacco.
17	"	15	30	15			
18	"	39	52	13			Tobacco and lager.
19	"	20	21	1			Tobacco.
20	"	15	16	1			
21	"	14	16	2			
22	Female	14	17	3			
23	Male	16	16				
24	"	17	17				
25	Female	17	65	48			
26	Male	13	35	22			
27	"	29	49	20		Malarial Neuralgia.	Tobacco.
28	Female	19	19				
29	Male	14	16	2			Tobacco.
30	Female	15	16	1			
31	"	16	17	1			
32	Male	14	30	16	Cephalalgia. Now well...		
33	Female	14	18	4			
34	"	14	17	3			
35	Male	15	18	3			
36	Female	15	17	2			
37	"	15	20	5			
38	Male	30	61	31		Malarial Cephalalgia.	
39	"	29	49	20			

Mills of Thomas Oakes & Co., in Bloomfield, and of Mr. Underhill, in Franklin—Continued.

Number.	Sex.	Age at entering mill.	Present age.	Number of years in mill.	Diseases inherited or acquired before entering mill.	Diseases acquired since entering mill.	Use of alcohol or tobacco.
40	Male	41	60	19			Tobacco and lager.
41	"	15	15				
42	"	14	15	1			
43	"	14	14				
44	"	14	23	9			Tobacco.
45	"	16	18	2			
46	"	15	15				
47	"	15	16	1			
48	"	40	70	30			Tobacco and lager.
49	"	14	18	4			
50	"	14	14				
51	"	13	15	2			
52	"	14	16	2			
53	"	14	14				
54	"	14	14				
55	"	14	15	1			
56	"	14	15	1			
57	Female	14	17	3		Anæmia.... Now well...	
58	"	19	20	1			
59	Male	26	36	10			
60	"	19	31	12			Tobacco and lager.
61	"	22	44	22			Lager.
62	"	14	24	10			
63	Female	24	28	4			
64	Male	34	46	12			
65	Female	15	20	5			
66	"	18	19	1			
67	"	15	17	2			
68	"	13	19	6			
69	Male	15	18	3			Tobacco.
70	"	46	66	23			
71	"	30	65	35		Conjunctivitis...	
72	Female	15	18	3			
73	"	24	27	3			
74	"	21	26	5			
75	"	15	20	5			
76	Male	22	34	12			Lager and Tobacco.
77	Female	15	24	9			

Mills of Thomas Oakes & Co., in Bloomfield, and of Mr. Underhill, in Franklin—Continued.

Number.	Sex.	Age at entering mill.	Present age.	Number of years in mill.	Diseases inherited or acquired before entering mill.	Diseases acquired since entering mill.	Use of alcohol or tobacco.
78	Female	16	23	7			
79	Male	30	33	3			
80	"	16	23	7			
81	"	15	28	13			
82	Female	15	24	9			
83	Male	32	60	28			
84	Female	17	18	1			
85	"	14	14				
86	Male	20	40	20			
87	"	17	44	27			
88	Female	16	19	3			
89	Male	15	25	10			
90	Female	17	19	2			
91	"	26	38	12			
92	"	17	20	3			
93	Male	16	22	6			
94	Female	14	23	9			
95	Male	15	71	56			
96	"	10	26	16			Tobacco.
97	"	17	30	13			
98	"	17	59	42			Tobacco.
99	"	13	32	19			Tobacco.
100	Female	32	37	5			
101	"	15	19	4			
102	"	14	18	4			
103	"	17	18	1			
104	"	18	38	20			
105	"	15	20	5		Erysipelas	
106	"	25	27	2		Hay asthma	
107	"	22	27	5			
108	"	20	40	20			
109	"	15	18	3			
110	"	17	23	6			
111	"	21	26	5	Nasal catarrh. Now better		
112	"	13	18	5			
113	"	19	24	5			
114	"	17	18	1		Bronchitis. See notes	
115	"	23	25	2			
116	"	15	18	3			
117	"	17	19	2			
118	"	19	25	6			

Mills of Thomas Oakes & Co., in Bloomfield, and of Mr. Underhill, in Franklin—Continued.

Number.	Sex.	Age at entering mill.	Present age.	Number of years in mill.	Diseases inherited or acquired before entering mill.	Diseases acquired since entering mill.	Use of alcohol or tobacco.
119	Female ..	15	21	6			
120	Male	13	17	4			
121	"	16	19	3			
122	"	25	45	20			Tobacco.
123	"	20	26	6			
124	"	14	23	9			Tobacco.
125	"	14	24	10			
126	"	10	70	60			Lager and Tobacco.
127	"	16	16				
128	"	19	24	5			Tobacco.
129	"	21	23	2			Tobacco.
130	"	15	24	9			Tobacco.
131	"	12	14	2			
132	"	10	48	38			Tobacco.
133	"	16	16				
134	Female ..	20	25	5			
135	" ..	15	16	1			
136	" ..	16	21	5			
137	" ..	16	18	2			
138	" ..	15	21	6			
139	" ..	15	18	3			
140	" ..	10	40	30			
141	" ..	15	16	1			
142	Male	14	28	14			
143	"	13	17	4			
144	Female ..	19	19				
145	" ..	15	21	6	Scrofula		
146	Male	15	17	2			
147	"	19	19				
148	"	19	21	2			
149	"	16	30	14			Tobacco.
150	"	24	39	15			Tobacco.
151	Female ..	13	14	1			
152	" ..	19	21	2			
153	" ..	19	22	3			
154	" ..	17	23	6			
155	" ..	15	19	4	Scrofula		
156	" ..	14	18	4			
157	" ..	26	29	3			
158	" ..	16	19	3			
159	" ..	18	24	6			
160	" ..	20	24	4			

Mills of Thomas Oakes & Co., in Bloomfield, and of Mr. Underhill, in Franklin—Continued.

Number.	Sex.	Age at entering mill.	Present age.	Number of years in mill.	Diseases inherited or acquired before entering mill.	Diseases acquired since entering mill.	Use of alcohol or tobacco.
161	Female	14	18	4			
162	"	21	21				
163	"	16	16				
164	"	14	19	5			
165	"	21	25	4			
166	"	21	21				
167	"	16	22	6			
168	"	16	17	1			
169	"	20	26	6			
170	"	12	18	6			
171	"	13	19	6			
172	"	16	22	6			
175	"	16	22	6			
176	"	16	18	2			
177	"	11	17	6			
178	"	15	21	6			
179	"	15	21	6		Eczema	
180	"	15	21	6			
181	"	13	19	6			
182	Male	20	26	6			Tobacco.
183	"	23	48	25			Lager and Tobacco.
184	"	18	21	3			Tobacco.
185	"	16	18	2			
186	"	28	40	12			Tobacco.

NOTE.—After a careful investigation by myself (Mr. Lane), and from the report of Dr. Stubbert's tables, I think we may be safe in concluding with him that while there is a slight tendency to bronchitis, catarrh and rheumatism, workers in wool are to be congratulated on having an occupation which is not necessarily unsafe or unhealthy. But there is need of more care as to dust.

COTTON GOODS.

We will treat this subject in the same manner as we did the woolen industry, as the processes of manufacture are much the same, especially in the departments in which we are interested. The cotton comes to the factories in large bales, and is sent to the picking-room, where it is fed by girls into the first set of pickers or "scutchers," which swifty pull the matted locks and wads to shreds, and beat out the heavier dirt, seed, &c. The cotton issues from these machines in a continuous sheet of wide batting, which is rolled up and passed on to the second and third set of scutching machines. It is delivered from these in a downy roll of "lap," as it is termed. The next stage of the refining process is the "carding-room." The "lap" or roll of cotton is fed into the carding machine, and comes in contact with a large cylinder, swifty revolving, and covered with fine wire teeth, so fine and close that there are 90,000 of them on a square yard of surface. These comb or brush away the cotton from the edge of the "lap," and in so doing naturally lay the fibers parallel. It then passes on to other cardings and combings, and is finally reeled off on large spools, and is sent to the spinning-room, where it is spun down into a fine warp; now it is ready for the warping or weaving-rooms, if to be made into cloth. If it is to be used for manufacture of thread, it is sent from the spinning-room to the reeling-room and reeled off into skeins, and sent to the dye-house, if for colored threads, and if for white, it is sent to the bleaching department, then to the drying-rooms, and from there to the different finishing departments.

We will now examine into the hygienic condition of the different departments. Beginning with the picking-room, we find this room well lighted and heated, but not well ventilated. The atmosphere is full of fine dust and cotton fiber; we should expect to find here a series of catarrhs and bronchial irritation. Let us see what we find after examining into the physical condition of the women employed.

No. 1. Age, 29; 11 years in business; no catarrh or bronchial trouble; health good.

No. 2. Age, 31; employed 4 years; no catarrh or bronchial trouble; health good.

No. 3. Age, 26; 6 years in business; has catarrh and headache.

No. 4. Age, 27; employed 5 years; no catarrh or bronchial trouble; health good.

No. 5. Age, 33; 7 years in business; has sore throat and catarrh; says, "dust irritates, is the trouble."

No. 6. Age, 24; employed 7 years; no catarrh or other trouble; good health.

No. 7. Age, 19; employed 4 years; has catarrh (pharyngeal); otherwise good health.

No. 8. Age, 22; employed 3 years; no catarrh or bronchial trouble.

No. 9. Age, 35; employed 6 years; no catarrh or bronchial trouble; health good.

No. 10. Age, 38; employed 20 years; no catarrh or bronchial trouble at present; takes cold easily; dust makes it worse.

We have, out of the 10 employed in the picking department, 4 who have catarrh or sore throat, 1 having headache with the catarrh. So we see that the inhalation of so much dust-fiber is a source of disease to the respiratory organs.

The next to be considered are the carding and spinning-rooms. As a rule these rooms are well lighted and ventilated, but the heat is almost tropical, the temperature ranging from 80° to 90° F. The atmosphere, besides being overheated, is filled with fine dust-fiber. Our first impression is that a person could not long endure such an overheated air. The majority of workers in the carding-room are women. Let us hear their own report as to the effect of the work upon them.

No. 1. Age, 18; employed 4 years; no catarrh or throat trouble; health good.

No. 2. Age, 21; 3 years in business; no catarrh or bronchitis; has headache.

No. 3. Age, 30; employed 8 years; no catarrh or throat trouble.

No. 4. Age, 25; employed 5 years; has catarrh and headache.

No. 5. Age, 20; employed 2 years; no catarrh or bronchial irritation; good health.

No. 6. Age, 31; in business 6 years; no catarrh; has malaria.

No. 7. Age, 18; in business 4 years; no catarrh; has headache.

No. 8. Age, 27; in business 5 years; no catarrh or bronchial trouble.

No. 9. Age, 28; employed 10 years; no catarrh; has headache.

No. 10. Age, 35; in business 9 years; no catarrh or throat trouble; good health.

No. 11. Age, 32; in business 6 years; has catarrh; no headache; uses tobacco and beer.

No. 12. Age, 29; in business 11 years; no catarrh or throat trouble; uses beer and tobacco.

No. 13. Age, 35; in business 13 years; has headache and malaria; uses beer and tobacco.

No. 14. Age, 29; in business 14 years; no catarrh; good health; uses beer and tobacco.

No. 15. Age, 23; in business 5 years; no catarrh or throat trouble; uses tobacco.

No. 16. Age, 39; employed 12 years; no catarrh or headache; good health; uses beer.

No. 17. Age, 20 (girl); in business 4 years; no catarrh or sore throat.

No. 18. Age, 19; employed 3 years; no catarrh or headache; good health.

No. 19. Age, 20; in business 2 years; no catarrh; has had bronchitis.

We will next examine the spinning-room. In this department the temperature is 90° F., while the carding-room is about 80° F. There is not so much dust as in the spinning-room. The Superintendent told me that some of the men on first entering could not endure the intense heat, but those who could soon became accustomed to it and apparently enjoyed good health. On questioning, we obtain the following:

No. 1. Age, 40; in business 13 years; no catarrh or bronchial trouble; good health; uses beer and tobacco.

No. 2. Age, 31; employed 11 years; no catarrh or headache; uses tobacco and beer.

No. 3. Age, 22; in business 8 years; in good health; uses beer and tobacco.

No. 4. Age, 44; employed 2 years; no throat or bronchial trouble; uses beer.

No. 5. Age, 38; in business 8 years; no catarrh; has headache.

No. 6. Age, 48; in business 18 years; has catarrh; poor health; uses tobacco.

No. 7. Age, 28; in business 8 years; good health; uses beer and tobacco.

No. 8. Age, 18; in business 5 years; has malaria; uses tobacco.

No. 9. Age, 18; in business 2 years; no catarrh; good health.

No. 10. Age, 16; employed 1 year; health good.

No. 11. Age, 20; employed 2 years; has malaria; no catarrh.

No. 12. Age, 31; employed 8 years; good health; uses beer and tobacco.

No. 13. Age, 24; employed 7 years; has had bronchitis; uses beer.

No. 14. Age, 22; in business 4 years; no catarrh; good health.

No. 15. Age, 24; in business 7 years; has catarrh; uses beer and tobacco.

No. 16. Age, 39; in business 19 years; never was sick; uses beer and tobacco.

Out of 34 questioned (of which 14 were women), 5 have catarrh, 6 have the headache, 3 suffer with malaria, 2 have had bronchitis, 16 use tobacco and stimulants.

While we find evidence of catarrh and bronchial trouble, we do not find it quite to that extent one would expect after examining into the hygienic conditions with which the operatives are surrounded. I confess to a severe irritation of the throat and bronchial tubes after being in the room for some time. The headache complained of was probably due to the excessive heat of the rooms.

The next room to be considered hygienically is the dyeing department. In this, as in the corresponding room of the woolen mills, we have an atmosphere loaded with dense steam, floors and walls saturated with water, and irritating gases rising from the coloring vats. Rheumatism, irritation of the respiratory organs and eyes should be expected. The testimony of the men is as follows:

No. 1. Age, 31; in business 9 years; has malaria; no rheumatism or catarrh; uses beer.

No. 2. Age, 29; employed 2 years; has good health; uses beer and tobacco.

No. 3. Age, 30; in the business 3 years; no rheumatism; good health; uses tobacco.

No. 4. Age, 44; in the business 6 years; has rheumatism; uses beer and tobacco.

No. 5. Age, 35; in the business 5 years; has sore eyes; uses beer and tobacco.

No. 6. Age, 45; in the business 6 years; has rheumatism; uses tobacco and beer.

No. 7. Age, 46; in the business 6 years; has rheumatism; uses tobacco and beer.

No. 8. Age, 39; employed 17 years; good health.

No. 9. Age, 50; in the business 20 years; no catarrh or rheumatism; uses tobacco and beer.

No. 10. Age, 48; in the business 7 years; has rheumatism and sore eyes; uses beer and tobacco.

No. 11. Age, 31; in the business 9 years; good health; uses beer and tobacco.

No. 12. Age, 37; employed 16 years; no rheumatism; good health; uses tobacco.

No. 13. Age, 52; in the business 12 years; has sore throat.

No. 14. Age, 33; in the business 6 years; good health; uses tobacco and beer.

No. 15. Age, 45; employed 22 years; has rheumatism and sore eyes; uses tobacco and beer.

Out of 15 employed in this room, 5 have rheumatism, 3 have sore eyes, 1 has malaria, 1 sore throat and 12 use tobacco and stimulants.

The bleaching-room was next examined. Chloride of lime is the agent used. The room is filled with steam and the floors are wet. Out of 13 men examined, we have this testimony: Three have the rheumatism, 2 have catarrh and sore throat, 1 has had pneumonia, 9 use tobacco and stimulants.

We find from a general summary of the different departments, that out of 72 employes questioned, 11 have catarrh, 7 have headache, 8 have rheumatism, 4 have malaria, 2 have had bronchitis, 3 sore eyes, 3 sore throat, 1 has had pneumonia, and 37 use tobacco and stimulants.

We might expect to find even more disease than is here shown to exist, for certainly the various kinds of exposure would justify such a belief. Rheumatism and catarrh seem to be the prevailing diseases. The report shows that workers in cotton suffer from diseased conditions much more than the workers in wool, owing to the large amount of dust and the overheated rooms. Professor Erismann, of St. Petersburg, states that he had "examined 100,000 workmen and found that, on an average, those engaged in textile industries were not as tall as other classes of workers. Their chest measurements and bodily weight were also inferior. These symptoms of degeneration of the textile workers were more particularly distinct among the spinners." Among men engaged in the cotton and linen manufacture in Lancashire, Dr. Ogle gives for phthisis a mortality figure of 272, against 220 for all males, while the relative figures for diseases of the respiratory system are 271 for the cotton industry, and 182 for all males. Dr. Ogle's figures are more in accordance with the general impression of the effects of cotton factory labor on the health of the workers.

The particularly unhealthy condition under which the textile trades are carried on, are commented upon as follows, in the supplement to the last annual report of the Registrar-General. He says: "Among the textile industries there are two in which the death-rates are high, and unfortunately they are the two in which by far the largest number of persons are engaged, viz., the cotton industry of Lancashire and the woolen and worsted industries of the West Riding. The mortality figures in these industries are largely in excess; those of cotton being greater. It can scarcely be doubted that the main cause of the differences is to be found in the conditions under which the industries are severally carried on, and especially in the differences that they present in regard to the dustiness and the temperatures of their respective working-places." In the cotton factories, the temperature of the weaving-sheds is described in a recent (October, 1883,) report by Dr. Bridges to the Home Secretary, as "tropical and relaxing," and dust, composed partly of filamentous particles of cotton and partly of mineral substances used for sizing, is stated to be a notable feature in most of the sheds. It will be found also, on examining the tables, that the death-rates from diseases of the respiratory organs are very high in the Lancashire and West Riding towns, where the textile trades are mainly carried on, as the following extract from the supplement previously mentioned, also indicates. Writing of the effect of dust on the respiratory organs, he remarks: More injurious than either coal-dust, wood-dust or the dust of flour, appear to be the filaments and fluff and other dusts that are given off in textile factories; the mortality both from phthisis and from diseases of the respiratory organs being higher among workers in cotton and workers in wool, than among persons exposed to either of the previously-mentioned kinds of dust. The workers in cotton factories fare worse than the workers in wool, the comparative mortality from the disease in question being 543 for the former and 462 for the latter. It must be remembered, however, that the air in the weaving-sheds of cotton factories contains not only flocculent matter, but also a large amount of dust from mineral substances of various kinds, used in sizing, and that the inhalation of mineral substances, judging from industries which have been examined, is much more injurious than the inhalation of textile filaments. The deleterious effects of dust upon the air-passages is increased both in the cotton and in the wool factories, and especially in the former, by the high temperature in which the work is carried on, and it is impossible to say how much of the lung mortality is due to the latter cause, and how much to the dust.

We pass now to a consideration of the means by which the evils can be lessened by an efficient system of ventilation. The main sources of impurities we have found to be as follows: Dust-fiber, excess of moisture, and heat. The construction of factories or rooms will govern the application of any system of ventilation to them. The ordinary method of ventilating factories has, I think, usually been inefficient by reason of the contrivances for exhausting the foul air being inadequate at their best, and uncertain in action when most needed, and also because the inlets for fresh air were not under control as to the quantity, temperature or direction of the air admitted. The remedy I would mention for the removal of these impurities is one I examined carefully while in Passaic. I visited while there the large "Dye and Print House" of Green & Barry, and through the courtesy of the Superintendent, Mr. Watson, I was shown their method for the removal of dust, steam, gases and heat. The system which they have adopted (which is the invention of Mr. Watson) is the large exhaust-fans, which are placed in the roofs and ends of the building. These fans are about two feet in diameter and make from 300 to 400 revolutions per minute. A system of ventilators is so placed for the inlet of pure air that all impurities are drawn or propelled toward the exhaust-fans, which rapidly draw in the dust and other matter and throw it out to the winds. On going out upon the roofs of the building and standing in front of the exhaust openings, one could readily see the practical workings of the system. Hot air, almost stifling, was issuing from the rooms, which were overheated; steam came from some, dust from others, all showing the use for which they were intended. Mr. Watson told me that "if the fans were stopped for a short time it was immediately noticed by the workmen," and since the adoption of this system the good effect upon the health of the operatives had been noticed.

In conclusion, looking at the important bearing that the efficient ventilation of factories has upon the health of the workers, it seems to me there should be some authority with power to compel the best-known means of ventilation to be carried out in what may be termed unhealthy trades, thereby lessening the danger to disease and lowering the mortality-rate among textile as well as other trades.

MEANS FOR PREVENTING THE SPREAD OF CONTAGIOUS DISEASES IN CITIES.

BY J. C. BAYLES, M.E.

A paper prepared at the request of the New Jersey State Sanitary Association, by Mr. J. C. BAYLES, President of the Health Department of New York.

GENTLEMEN—My experience in connection with the management and restriction of contagious diseases in cities being limited wholly to New York, the only information I am able to give you on the subject you have asked me to discuss has specific relation to the appliances and methods of the Health Department of New York city. As a prelude to this brief presentation of facts, I desire to remind you that, not being a physician, I shall avoid all questions upon which there is likely to exist a difference of medical opinion. In the sanitary administration of a city, economic as well as medical questions constantly arise, and with the former rather than the latter the executive head of such an administration has to deal. It has been remarked that in military operations success depends quite as much upon the efficiency of the Quartermaster's Department as upon the skill and experience of the commanding General. Food, military supplies and transportation are as necessary to the successful operations of an army in the field as its plan of campaign. In this paper I shall endeavor to show by what material agencies the best judgment of the medical profession, as to the handling and restriction of contagious diseases in New York city, is given practical application for the public good.

Before those responsible for the sanitary administration of a city can do anything to limit the spread of contagious diseases, they must be advised promptly when and where such diseases appear. For this information they are dependent upon the reports of physicians. Such reports are required by law, but until lately the observance of this law was largely voluntary. Many physicians neglected to report cases under their care, and in some instances refused. Perhaps a reason for this was found in the fact that such reports from physicians were not always regarded as privileged communications. By one means or another the enterprising reporters got access to them, and, as the result, those which were supposed to possess any features of sensational news interest were investigated by the reporters, to the great annoyance of physicians and patients. As a first step in the direction of holding physicians to the responsibility imposed upon them by law, they were given positive assurances that such reports sent to the Health Department would be held sacredly confidential, and this promise has been kept so carefully that the objection which originally existed in the minds of physicians to reports of this kind have largely, if not wholly, disappeared. At the present time the unreported cases are known to be very few in number. The death returns are carefully watched, and afford an index to the work of the physicians in this respect. When cases of failure to report are investigated, it is usually found that conditions exist which excuse the physician. The disease may be masked by complications having marked and perhaps misleading symptoms, leaving the physician honestly in doubt as to what he is dealing with until it has taken definite shape, or a case may be so rapidly fatal that the physician has no opportunity to report it between the time he is first called in and the affixing of his signature to the death certificate. Some allowance must also be made for erroneous diagnosis on the part of physicians of limited skill and experience, and when a physician elects to defend a violation of the law by impeaching his own intelligence, up to a certain point his plea is unanswerable. I am happy to say, however, that there exists a feeling of confidence on the part of the medical profession of New York toward the Health Department which is productive of mutually pleasant and advantageous relations, and it is very seldom necessary to invoke the penalties of the law to compel reputable practitioners to comply with its requirements.

Having information as to the occurrence of cases of contagious disease, this information must be used promptly and discreetly. To facilitate such use, the city is divided into eleven districts, each of which has a Medical Inspector, whose duty it is to examine and report upon every case occurring within his district of which he has official information. These inspections are made as promptly as possible, as in matters of this kind a delay of even a few hours is dangerous. The District Medical Inspectors deal with every form of contagious disease reported to the department, except small-pox, which requires a special service. For small-pox there are eight Medical Inspectors engaged exclusively in vaccination and in investigating reported cases. The staff of the Contagious Diseases Division also includes a Chief Medical Inspector, an Assistant Chief Inspector, two expert diagnosticians and two eminent pathologists, who are always available for consultation. Of what may be called the plant of this division I will speak later.

The method of procedure in dealing with cases of contagious disease in New York is, briefly, as follows: Reports of cases are received at the office of the Chief Medical Inspector, and are transmitted as promptly as possible to the District Inspectors. These gentlemen are at all times in telephonic communication with headquarters, and in going about their districts are instructed to call up the Chief Inspector's clerk for instructions, whenever they are able to do so. Telephones are so numerous that this entails no difficulty, druggists and physicians being always willing to give our officers the use of their instruments for this purpose. Instructions are also sent, in special cases, by telegraph, by the special telegraphic system of the Police Department, by mail when the lateness of the hour warrants this method of transmission, or by messenger. The Inspector thus notified goes as promptly as possible to the house indicated, to see that the case is properly taken care of from a sanitary standpoint. He inquires as to the physician in charge, the measures for isolation, and the instructions of the physician. He also inspects the premises carefully, from cellar to attic, to discover if there exist conditions which might be supposed to cause, aggravate or propagate the disease with which he is dealing. If the case is in the hands of a reputable physician, the Medical Inspector does not see the patient, nor in any way interfere with the physician's work or directions. If, however, he is in doubt as to the standing of the physician having the case in charge, or discovers evidence that the family have not been properly instructed and do not appreciate the necessity for careful isolation, or for any other reason deems it necessary to do so, he finds the physician in responsible charge and confers with him. From this point he must act according to his judgment. If he has reason to believe that the case is in good hands and will not be neglected, his duty is for the moment at an end. If he has doubts on this subject, he reports the case promptly to the Chief Medical Inspector, who then assumes the responsibility and gives such directions as the facts call for. By this system the department is enabled to work in entire harmony with the medical profession. The Medical Inspector is required to observe the code of professional ethics in his official work as carefully as he would in private medical practice, and his failure to do so is followed by reprimand or dismissal.

In most cases the procedure above described concludes the work of the department. These include pretty much all cases of contagious disease other than typhus fever and small-pox occurring in private houses, in the families of persons of average intelligence, comfortable circumstances, and provided with medical attendance. In a great city, however, and especially in a city in which 1,079,728 people live in the 32,390 tenement and apartment-houses which distinguish it from other cities, it is necessary that the Health Department shall take more radical and far-reaching measures of public protection. A great many cases are found, on inspection, for which no regular medical practitioner is willing to assume any personal responsibility. He is called in, recognizes the disease, prescribes for it and reports it. The family may not be able to employ regular medical attendance, and are content with such medical advice as they get during one visit or from a single office consultation. In such cases no question of professional ethics arises, the physician, as the rule, being very glad to be relieved of any further responsibility after making his report. The Medical Inspector takes charge of the case and promptly reports it to the Chief Inspector as calling for special attention. If the case cannot be isolated, removal to the hospital is advised. Before removal, however, the patient is seen by the Chief Inspector, or by one of the diagnosticians of the department, as it is necessary that the judgment of the District Inspector as to the nature of the case and the desirability of removing it, should be revised by some one having larger official responsibility. Where the facts warrant it, the patient is removed to one or the other of the department hospitals. If removal is unnecessary, or can be avoided without danger to persons not already infected, the course of procedure is that which any experienced physician would employ if in charge of the case.

Supplementing the work of the district physicians we have a corps of disinfectors, who follow the Inspectors, distributing circulars of information and offering such disinfecting solutions as are immediately needed. The disinfector also applies these disinfectants when necessary, or instructs nurses and attendants in their use. He again visits the premises when the District Inspector reports that the disease has ceased to be contagious, and follows his instructions as to the measures which are necessary to "clean up" after the case, dispose of bedding and other infected articles, and leave the premises in safe condition. If the patient dies, it is required that the funeral shall be conducted in strict accordance with the requirements of the Sanitary Code. Undertakers are held to a strict accountability, and their work is so far supervised and watched by the officers of the Health Department that it is almost impossible for them to violate the law. As this is a matter of great importance, those for whom the subject has concern will be interested in reading the circular defining the duties of undertakers and surviving relatives, copies of which are given out with every burial permit for a case of contagious disease, and are also sent to the house by a police officer of the Sanitary Squad. It is as follows:

"NOTICE.

"RULES GOVERNING PROCEDURE AFTER DEATHS FROM CONTAGIOUS DISEASES.

"The attention of those whom it may concern is hereby called to Section 204 of the Sanitary Code, as follows:

"There shall not be a public or church funeral of any person who has died of small-pox, diphtheria, scarlet fever, yellow fever, typhus fever or Asiatic cholera, but the funeral of such person shall be private; and it shall not be lawful to invite or permit at the funeral of any person who has died of any of the above diseases, or of any contagious or pestilential disease, or at any service connected therewith, any person whose attendance is not necessary, or to whom there is danger of contagion thereby.

"Undertakers are directed, for their own protection, to take notice of the requirements of Sections 148 and 210 of the Sanitary Code, as follows, to wit:

"'That no person shall, within this city, without a permit from this department, carry, remove, or cause or permit to be carried or removed, any person sick with small-pox or other contagious disease, or remove or cause to be removed any such person from any building or vessel to any other building or vessel, or to the shore, or to or from any vehicle in any part of the city. Nor shall any person, by any exposure of any individual sick of any contagious disease, or of the body of such person, or by any negligent act connected therewith, or in respect of the care or custody thereof, or by a needless exposure of himself, cause or contribute to, or promote the spread of disease from any such person, or from any dead body.

"'It shall be the duty of every undertaker having notice of the death of any person within the city of New York of small-pox, diphtheria, scarlet fever, yellow fever, typhus fever, Asiatic cholera, measles, or any other contagious disease dangerous to the general health of the community, or of the bringing of the dead body of any person who has died of any such disease into such city, to give immediate notice thereof to this department. And no undertaker shall retain or expose, or assist in the retention or exposure of the dead body of any such person except in a coffin or casket properly sealed; nor shall he allow any such body to be placed in any coffin or casket unless the same be immediately and permanently sealed. Nor shall he assist in the public or church funeral of any such person.'

"It will be understood that the permit for the burial of ——— ———, issued under Section 151 of the Sanitary Code, is subject to the conditions imposed in Sections 148, 204 and 210, above quoted, and that it is a violation of duty on the part of the undertaker to assist in any needless exposure of the body of any person who has died of a contagious disease, or to contribute in any way to the spread of disease from any such body, or to conduct or assist in a public funeral of any such person.

"Information as to the proper treatment of a body after death from a contagious disease, and as to cleansing and disinfection of clothing and premises, will be furnished by this department on application to the Chief Inspector of the Division of Contagious Diseases.

"By order of the Board of Health."

When necessary, the officers of the Health Department undertake the disinfection and purification of premises. This includes cleansing walls and floors and removing, for treatment, all fabrics or other articles likely to hold or carry contagion which have been exposed to it. The manufacture of ready-made clothing in tenement-houses is one of the great industries in New York, employing, probably, more persons than are engaged in any other single trade. This clothing is largely made up in the living and sleeping-rooms of the persons who take it home, and it is not unusual to find a pile of finished or partially-finished garments in a room in which one or more cases of contagious disease have been treated, and in which deaths have occurred. It is obviously the duty of the department to seize all this material and remove it for disinfection. We are as careful of the property thus taken as our duty permits us to be, but as a good deal of it is of a poor quality, cheaply dyed, it frequently happens that the fabrics are injured in the process of disinfection. We shall be better able to avoid such injury in the future than in the past, but as the law empowers the officers of the department to seize and destroy all such articles when in their judgment it is necessary, no legal liability for injury during disinfection has ever been recognized by the courts.

The plant of the Contagious Diseases Division is of necessity large and costly, but a further liberal expenditure is needed to adapt it to the requirements of a great city like New York. For the transportation of patients we have coupés and ambulances. The coupé resembles, externally, a private carriage, but is so fitted up inside as to render frequent and thorough fumigation practicable. This carriage is used whenever it can be, and always in removing patients, not too sick, from parts of the city where the presence of an ambulance would attract attention or create alarm. If a patient is able to be removed in a carriage, this method is preferred, and it robs removal to a hospital of half its terrors if the journey thither is made comfortably, and even pleasurably for those to whom a carriage-ride is a novelty. In the case of the very sick, the ambulance is necessary. These vehicles are well built and equipped, and have all the conveniences required. When the city was menaced with cholera during the summer of 1887, they were reconstructed and put in a condition to safely handle this disease. The bottoms were made tight with sheet-iron casings, and racks were provided for vessels containing disinfecting solutions for instant use. The department also has wagons for the conveyance and distribution of disinfecting solutions, which are not much used at present.

Of hospitals the department has three. The Willard Parker Hospital, near the foot of East Sixteenth street, is at present devoted entirely to diphtheria and scarlet fever. These are treated in separate wards, are provided with separate corps of nurses, and communication between these wards is so carefully guarded that no complications arise, or are likely to arise, from the presence of the two diseases under one roof. Its management is constantly supervised by the Medical Commissioner and the Advisory Committee, including some of the most eminent physicians of New York. Near the Willard Parker Hospital, but far enough from it to permit complete separation, is the Reception Hospital, to which are sent all cases of typhus fever, small-pox and other contagious diseases for which provision cannot be made in the Willard Parker Hospital. It is largely a hospital of observation. Well-marked cases are not retained there, but are sent by the steamboat of the department to the larger hospitals on the North Brother Island. The buildings and improvements on that island are a surprise and pleasure to all who see them. The surroundings are beautiful, the buildings capacious and well appointed, and the accommodations for patients comfortable and convenient. The system includes a large brick small-pox hospital, seven isolated pavilions where other diseases can be separated or small-pox patients received, if necessity exists, an administration building, a morgue, a disinfecting-house and other requisite structures. In a city like New York it is necessary to provide accommodations in excess of the average requirements of the service, as we are liable at any time to have outbreaks of disease which will tax the accommodations of the department.

The disinfecting plant in connection with the Willard Parker Hospital in East Sixteenth street, is not in all respects satisfactory, but is as good as we have thus far been able to provide. With the beginning of next year we shall undertake the construction of a much more ample disinfecting plant, supplemented by better transportation facilities. The new plant will include a large hot-room, with means for raising the temperature to 280° Fahr. We need this large room for the reason that a small chamber of any kind into which fabrics to be disinfected, have to be put folded, does not meet the requirements of the case. Last winter an interesting experiment was tried, which gave rather startling results. Into the hot chamber was put a blanket which had been exposed to the weather, and had frozen stiff, the ice caking in its folds. This blanket was folded so as to occupy convenient space, and was subjected for twenty-five minutes to a temperature of 260 degrees. At the end of this time it was taken out, and ice was still found in its folds; showing that very little dependence can be placed upon the penetration of heat into the interior of a folded woolen fabric. In the large hot-room to be provided, and for which an appropriation has been made, all such articles can be hung loosely on wires, and so exposed to a high temperature in every part. We shall also have more ample accommodations for disinfection with sulphurous acid, boiling disinfecting solutions, steam, &c. The new plant will include four wagons provided with a complete disinfecting outfit, and each wagon will carry two men who have had training and experience as disinfectors. For so large a city as New York, six wagons and twelve men are really needed, but for the present we hope to do good work with the means at our command.

During the nine months from January 1st to October 1st, 1888, 18,276 cases of contagious disease were visited and investigated, making an average of 1,828 for each Inspector. During this same time the Medical Inspectors made 17,490 sanitary inspections of premises, and 5,948 re-inspections. They forwarded 3,258 complaints of discovered nuisances calling for abatement, of which 3,073 were abated in consequence of their effort; the balance, 185, remained in the hands of the Inspectors for further work on their part.

I am happy to say that the Health Department of New York enjoys the confidence and co-operation of the medical profession, whose representative members are always glad to assist its work in any way in their power. At a meeting of the Academy of Medicine held last spring, a committee of conference with the Health Department was appointed at the request of the Commissioners, and this committee has always been prompt and faithful in the discharge of all duties committed to it. It confers with the Health Commissioners at their request, on all matters relative to the public health, showing especial activity on the several occasions during the past two years when the city has been menaced by contagious diseases received at Quarantine or prevailing as epidemics elsewhere in the country. In my judgment, the success of the work which the Health Department is now doing, results in a large degree from the care taken by the officers of the department to observe all rules of professional ethics in their contact with the medical profession, and the positive instructions of the Commissioners to the Medical Inspectors not to interfere with the work of a physician, unless such interference is necessary. Under these circumstances, the help of the department is welcomed by the profession, and the division of responsibility is so nicely adjusted that there exists no room for conflict between the private practitioner and the department. It must be remembered, however, that all practicing physicians cannot be entrusted with this kind of responsibility. For example, I recall an instance in which a physician in general practice, and not without experience, finding in his office a patient badly broken out with small-pox, who had called to consult him, took this patient to the hospital in an elevated railroad train, and did not seem to appreciate, until arrested and made defendant in court, that he had been guilty of an act which justified his prosecution. I am happy to say, however, that such instances are rare, and that experience in New York has shown that the sanitary administration of a city and its medical profession can work together in perfect harmony for the public good.

NEW JERSEY SANITARY ASSOCIATION.

Report, with Outline of Papers and Discussions, Session of 1888.

BY D. C. ENGLISH, M.D.

The fourteenth annual meeting of the New Jersey Sanitary Association was held in the Assembly Chamber, at the State House, Trenton, commencing Friday morning, December 7th, at eleven o'clock. The President, Henry Mitchell, M.D., of Asbury Park, in the chair.

After a brief report by the Secretary, Herbert B. Baldwin, analytical chemist, of Newark, read the first paper, on

WATER FILTRATION.

He spoke of the popular idea of filtering water to improve its physical appearance, while many are skeptical as to its material improvement, in so far as its injurious qualities are concerned. The pollution of water and of the various constituents that enter abnormally into its composition, was next considered. The water has its source in either surface streams and rivers, or in wells of greater or less depth. The ultimate source in either case is rain-water, and whatever impurities it contains are taken up at some period and between its existence in the state of vapor and the condition in which we obtain it. In case of rivers flowing through a thickly-settled country, the pollution is due more to the emptying in of the waste products of manufacture and sewage than to substances of mineral and vegetable origin. The former class of pollutions, termed artificial, are the most dangerous enemy of the sanitarian. Being in solution with a large volume of water, they leave no visible proof of their existence. The other class, called, in contradistinction, natural, consist largely of suspended matters of clay, vegetable fiber, plant life, &c.

In case of the artesian or deep wells, unless the removal of some of the mineral constituents be the object in view, there is, generally, little need of filtration, and the shallow or surface wells, if so situated as to be at all liable to contamination, had better be abandoned, if possible, in favor of a different supply.

Mr. Baldwin then considered the requirements of the sanitarian in the construction of a filter, and the existence of micro-organisms in all natural waters, in some cases causing disease, and in other instances these germs seem to be harmless. While, therefore, it could not be said that the removal of every germ is essential to the purification of water for potable uses, it would no doubt be advisable to aim at an absolute extinction.

The paper then deals with the agencies at work to purify surface-water from foreign organic matter, viz., oxidation, precipitation, dilution and deposition, and suggests that we cannot do better than to imitate these processes as nearly as possible. Reference is made to the construction of some of our modern filters as practically carrying out this plan. The older systems of filtering-beds and settling-basins were referred to as having great practical value in reducing suspended flocculent matter and the percentage of soluble organic matter, and also the number of micro-organisms. The use of these in London, England, and in Poughkeepsie, N. Y., were detailed as illustrations, as were also the filter galleries and basins constructed in many places in Massachusetts.

Mr. Baldwin then considered those filters or systems wherein chemical and mechanical treatment of the water are combined, and believed the results already obtained demonstrated that we must look to some such method for the solution of the problem of water-filtration. A detailed description was given of this system as recently erected at Long Branch. The paper closed with a brief reference to house filters.

By request, Dr. E. M. Hunt, Secretary of the State Board of Health, opened the discussion of the paper. He spoke of the changes which take place not only by oxygenation, but nitrification, per micro-organisms, doing the work, but most of it within eighteen inches of the surface. As to germs as related to water, he thought we could not as yet go so far as to distinguish pathogenic germs, and therefore it is safer to get out as many as we can. Filtration will greatly reduce the number of microphytes, since their food is removed. He spoke of his personal experience with Trenton water; also of the change effected at Long Branch from bad to satisfactory filtration. The experiments of the Massachusetts Board showed covered filter galleries better than open ones.

Prof. F. A. Wilber spoke of the use of alum in the purification of water, one grain to the gallon being effective, and did not believe it injurious in that proportion. He spoke of the change of material in filters, spongy iron, &c., and believed there is a great field for study and criticism.

Dr. F. Gauntt, of Burlington, had been much interested in the paper. Water had become a source of dread from the diseases arising therefrom. All suspicious water should be changed and sterilized by heat. Boil the water. This simple process is safe until we can get good water, and it is better than filters. He believed in alum precipitation; it may act as a germicide. Bakers, perhaps, use it for same purpose—to stop fermentation in yeast.

Dr. I. N. Quimby, of Jersey City, was interested in filtration—more interested in Nature's power to take care of these germs. The bacterial elements that are vegetable are good for correction of impurities which get into streams. The people should know that there are some germs which are not dangerous. He thought the most important thing to do was to call on the Legislature to stop the befoulment of streams; then let us take care of the sewage. Jersey City is struggling against schemers. No doctor there traced a single case of disease to the use of water; the hue and cry there is simply for financial aggrandizement.

Dr. W. K. Newton, of Paterson, thought it a remarkable statement that no case of disease in Jersey City could be traced to the water. "Maybe there is no physician in the place able to make the biological or other examinations." He complimented the paper as having been one of the ablest presented for a long time. It is an important fact that filters remove pollution when in large particles, and make water palatable. Such places as Rahway and Paterson must look on the subject from the engineer's, as well as the bacteriologist's standpoint.

G. W. Howell, C.E., of Morristown, had no practical experience, since he, as an engineer, had sought to introduce water that does not need filtering. Water falling on unpolluted soil is good and pure.

The discussion was continued by G. P. Olcott, C.E., and J. C. Pumpelly.

Mr. F. D. Budlong, of Hightstown, asked "Is well-water or filtered rain-water best?"

Dr. Gauntt believed that depended on the well and its surroundings. We must take into consideration all the surroundings.

Dr. Hunt said we should remember all water is rain-water. The South depends on rain-water. Parts of our State have to use it because of limestone. It is safe if properly collected and stored.

G. P. Olcott, C.E., related his experience of one cistern made better by a small filter between the cistern and the supply-pipe and branch of the outflow-pipe. For six years it has kept sweet. He spoke of the use of charcoal and sand. Brick filters are often useless. The inlet-pipe should go to the bottom of the cistern.

IMPURE MILK AS A CAUSE OF DISEASE.

The second paper read was by Daniel Strock, M.D., of Camden, on "Impure Milk as a Cause of Disease."

The Doctor commences his paper with remarks concerning the universal use of milk in some form and of the consequent interest of all in securing pure milk. The importance of scrutinizing the milk and the source from whence it is obtained is now being recognized by physicians, scientists and the press. While the healthy and robust sometimes partake of unwholesome or inferior milk with impunity, to the typhoid fever patient or others suffering with low forms of disease, or to the infant deprived of its natural food, the quality of the milk often decides the issue of the struggle for life.

The quality of milk required was then discussed, and also the irritant poison, termed tyrotoxicon, which sometimes develops in milk and is undoubtedly in many cases the cause of diarrhœa and cholera infantum, as well as of the poisoning sometimes caused by partaking freely of ice cream made from such milk. Dr. Newton's investigation of the seventy-three cases of poisoning at Long Branch, in 1886, was cited as conclusively demonstrating that tyrotoxicon was the poison present, and that improper management of the milk was the cause of its formation.

The transmission of the germs of typhoid fever, phthisis and other diseases by the milk from diseased animals or those that drink impure water, was then considered, and the importance of expelling all dairy cows from city limits, because from their unhealthy surroundings and the quality of the food they receive it has been proven that they are a prolific source of pulmonary consumption, through their milk, which in some cases has been loaded with the bacilli of the disease. Scarlet fever and diphtheria have also been conveyed by milk. Mr. Ernest Hart's report to the International Medical Congress, 1881, is cited, in which he collected and tabulated fifty epidemics of typhoid fever, fifteen of scarlet fever and seven of diphtheria which were traced to milk. Milk contaminated with pus from an inflamed udder or an abscess on the udder has given rise to stomatitis in children, &c. Instances are cited by Dr. Strock of the epidemics of typhoid fever at Cologne, Germany, caused by milk from an infected dairy, and in Aberdeen, Scotland, in 1881, when 88 per cent. of the families using the milk from a certain supply were attacked. Also the epidemics of diphtheria in York and Camberly, England, in 1887, and the epidemic of diphtheria in Melrose and Malden, Mass., 1886, the direct and immediate outcome of an infected milk-supply, out of 16 foci of infection 13 having received the impure milk.

The writer points out the danger, during the winter season, of obtaining the water-supply for cattle from wells that are in close proximity to the barn and which receive a variable amount of liquid manure either directly, as after heavy rains, or by percolation through the soil, and asks, is it not possible that the barnyard wells hold a causative relation to many cases of typhoid through the medium of the milk? And may we not have here a partial explanation of the well-known tendency of this fever to prevail more extensively in the winter months? Owners of cows should be impressed with the danger incurred by allowing their stock to drink of impure water, not only from the possibility of contaminating the milk, but also of the risk of pecuniary loss by the cattle themselves becoming diseased. The duty of the physician and of the press was impressed. Fresh air, sunlight, pure water, nutritious food and exercise are as essential to keep a cow in good health as they are for the owner. Every dairyman and retailer should know the quality of the milk he sells, whether it is up to the State's standard (spec. grav. 1.029 and 12 per cent. of solids), but this does not demonstrate whether the cow that gives the milk of this quality is diseased or healthy. We can never be sure of our milk-supply until we have inspectors of dairy cattle, who shall examine all cows in the State at least once every three months, with authority and power to destroy or isolate any unhealthy animals and prohibit their milk being used; also to examine their surroundings, food, water-supply, &c. The Doctor insists that it is the duty of the State to protect the people against contaminated as well as adulterated milk. Legislation bearing upon the milk question should be directed not only against the original handlers of the article—the dairymen and wholesale dealers—but attention should also be given to the retailers as to how and where they keep the milk. The Local Health Boards should have authority to inspect the premises of retailers of milk.

The discussion of Dr. Strock's paper was opened by Shippen Wallace, Ph.D., of Burlington, who spoke of the importance of the subject. He spoke of typhoid fever cases in New York city, Long Branch and Philadelphia which had been traced to the milk-supply.

Dr. Parmley, of Oceanic, thought that milk when just to the point of fermentation is more dangerous than when it has actually fermented, for going into the stomach the process is carried on.

Dr. E. M. Hunt thought it practicable to inspect city dairies. In cities cattle should be registered and the milk-supply be inspected. He cited many cases in which the condition of cattle was outrageous. Boards of Health should have the legislation suggested, and close, systematic inspection should be made, and the people, especially in our cities, taught its importance.

Dr. W. K. Newton spoke of milk as an excellent culture medium. It does absorb germs. Scarlet fever has been conveyed by it, we know. The cow itself may have had scarlet fever, not probably due to exhalations but to water containing germs. Ptomain poisoning is well known from milk; as to tuberculosis our knowledge is yet unsatisfactory, but bacilli have been found in milk. He believed in inspection or supervision of sale of milk in our cities, but it was impossible for State officers to do this. Local Boards should inspect all stables. The city of Paterson has very much reduced the number of cattle in the city limits. We should have an intelligent public sentiment in these matters. The Legislature should give us some power in the matter of feeding of cattle. The danger from brewers' grain was referred to.

Upon motion of Dr. Newton, Dr. E. S. McClellan, of Paterson, was given permission to exhibit the working of his patent trap, in the ante-room, at the close of the morning session. A large number of the members availed themselves of the opportunity, and were much pleased, not only with the admirable manner in which its working was shown, but also with the apparent excellence of the device.

REPORT OF DELEGATES TO THE FOOD CONVENTION.

Dr. Newton presented the report of the delegates to the Washington, D. C., Food Convention, as follows:

"The movement, having for its object the protection of the food-supply of this country from adulteration, had its origin with the National Board of Trade. That Board, at its annual meeting, 1879, adopted resolutions authorizing the appointment of a committee to investigate the matter, to report on the necessary means for checking the evil of adulteration, and also to present a draft of a bill to be presented to the National and State Legislatures, to be by them enacted in legal form. A prize of $1,000 was offered for the best report on the subject and for a model of a law. The committee of the National Board of Trade was composed of the following eminent men: Dr. John S. Billings, Prof. Charles F. Chandler, ex-Chancellor Williamson, and Messrs. Hardy and Gano. They reported, in 1880, a draft of a law that was subsequently enacted in the States of New Jersey, New York, Massachusetts and Michigan. After years of trial it was ascertained that the State legislation alone was not able to cope with the evil of adulteration, as the laws were, of necessity, only in force inside the States making them, hence did not affect importations, articles transported from one State to another, or articles manufactured or sold in States having no law. To try and remedy this defect, and to urge on other States the passage of proper laws, a meeting called a Pure Food Convention was held at Washington in 1887.

"After considerable discussion this convention adjourned after appointing a committee to report during the next year. This committee was to draw up a bill to be submitted to Congress, and also to call another convention. The committee prepared a law after the plan of those in force in the States and urged influential members of Congress to have it enacted, and the work was so well done that it is probable that the bill would have passed had the convention never met.

"According to instructions, this committee called a convention, to be held in January, at Washington, and it saw fit to invite thereto delegates from grocers' associations, trade journals, representatives of manufacturers and others. Corporations engaged in the manufacture of bogus articles of food were also invited. Thus the convention was largely composed of persons ignorant of the objects of the meeting, or actually engaged in the very practices to which the meeting was supposed to be opposed. The mistakes of the Committee on Credentials also added to the lack of harmony, as it admitted any person, no matter whence he came or what his claims.

"After the organization of the meeting, in the course of which one of your delegates was elected President, the proposed bill was taken up, section by section, and discussed very thoroughly and exhaustively. Nearly every section had an opponent on the floor. As a consequence, discussion was very prolonged and acrimonious. When the discussion had concluded, the original draft of the proposed law was not to be recognized in the one adopted by the convention.

"At one time your delegates threatened to withdraw from the hall, on the ground that the objects of the convention, as stated in the call, were now thoroughly perverted, and also that the action of the delegates was at variance with the professed purpose of the convention as stated in its title.

"We may briefly sum up by saying that the so-called Pure Food Convention was a failure, and that the action there taken has been the means of postponing national legislation in the interests of pure food for years. The real advocates and influential men who have worked for years in the hope of obtaining recognition from Congress, are no longer connected with this spurious movement, and the convention has been converted into a National Grocers' Association.

(Signed) "WM. K. NEWTON,
"SHIPPEN WALLACE,
"*Delegates.*"

AFTERNOON SESSION.

Discussion was had on the report of delegates to the Food Convention.

Dr. E. M. Hunt spoke of the importance of a clear discernment between the health and commercial parts of this question. We must be on the alert, and throw our influence on the right side. The question of securing pure, wholesome food was one of pressing importance.

Prof. J. Madison Watson, of Elizabeth, said he had not anticipated the character of this report. He felt there should be some action taken on this matter by our Association.

Dr. Shippen Wallace gave an account of some of the workings of the convention, especially as to the officers and control of the convention. He thought the convention should be designated the "Pure Fraud Convention," as practically, the effect was to protect the retailer in the sale of adulterated goods.

On motion of Prof. Watson, the report was referred to the Executive Council for their action.

Dr. W. K. Newton was then introduced and read a paper on "Ice as a Source of Disease."

(The paper will be found on page 119 of this Board of Health Report.)

The discussion of this paper was opened by Dr. David Warman, of Trenton. He spoke of the subject as one of great importance, in which we are all interested, and of ice itself in intemperate quantities, as deleterious to health, and quoted from an article of his own, showing that ice-water is injurious to the people, especially in hot weather. He then referred to several instances in which disease had been caused through the use of impure ice. He believed that the Trenton ice was good, having been taken, mostly, from the Delaware river.

Dr. F. Gauntt spoke of his living not very far from the city of Philadelphia, where they had more deaths from typhoid fever than any other city in the world. Its water-supply was from the Schuylkill river, and was badly contaminated. Last winter a large ice crop was secured from that river, and this summer many more cases than usual of the fever prevailed. He believed the ice was partly the cause of its prevalence. Camden is now having an epidemic of typhoid, and he thought ice has done much to increase the trouble this year.

Mr. J. C. Pumpelly, of Morristown, spoke of the Morristown ice-supply as coming largely from a pond near the city, in a hollow. He thought the purity of their ice was open to suspicion, and that the Local Board there, as elsewhere, should investigate.

Prof. Watson thought this subject worthy of consideration and action. We can do efficient service in preventing the use of impure ice. Water can be cooled without the direct use of ice; put ice around it and not in it.

Dr. W. K. Newton spoke of the danger of using impure ice, and of the necessity of taking action before people were killed by it. Also of the preserving power of ice against putrefaction. The typhoid bacillus we know is preserved. The danger often arises by contact in refrigerators. He urged when there was any doubt as to the purity of ice, that families get cool water by putting water in thin glass bottles in the refrigerator, as suggested by Dr. Mitchell.

The subject was further discussed by Drs. Alexander Wilder and Quimby and Counselor Harvey.

DISPOSAL OF GARBAGE.

Jacob S. Wetmore, Esq., of Englewood, presented a full report of the action of the committee, of which he was chairman, appointed at the last year's meeting to wait upon the authorities of New York city and endeavor to have the disposal of their garbage so changed as that it should not be washed up on the banks of the Hudson river and along our coasts, thus creating serious nuisances.

The report showed that the committee had acted with commendable judgment and energy; that they had been very courteously received, and that the nuisances had been almost entirely abated. Complaint had, however, been made recently that at one or two points the trouble was again threatening, and therefore, on motion, the committee were thanked for their efficient work and continued during the ensuing year.

Dr. E. M. Hunt spoke of the work of this committee as demonstrating that when in the right, perseverance can accomplish what is wanted.

Dr. Henry Mitchell spoke of the suffering from this nuisance at Asbury Park; the material proved where it comes from, and he was anxious for its abatement and favored continuing the committee.

After this report Dr. E. M. Hunt referred to the McClellan trap, which had been exhibited during the recess, as worthy of examination.

He also spoke of the need of more knowledge of practical plumbing, and also of the need of proper legislation. The only general power needed by the State Board is to attack nuisances where the Local Board fails to do its duty, not by their own act, but by a bill of complaint before the Chancellor.

INSTRUCTION OF SANITARY INSPECTORS.

Dr. W. K. Newton, chairman of the committee appointed last year to consider and recommend some plan for the instruction of Sanitary Inspectors, &c., reported as follows:

"Before entering into the discussion of the main points of the subject, it would be well to bring into review the requirements for sanitary administration as set forth in the amended Public Health law of 1887. That act requires that every city, borough, town and other local municipal government shall have a Board."

After reference to the provisions of the State law as to Inspectors, the report proceeded to outline what should be regarded as adequate preparation. The report says:

"In drawing this up, we have ignored the fact that many, if not most health officers in our State are physicians, hence have studied, in their medical course, many of the subjects required, but the items are put in to complete the discussion. If in cities the duties of medical officer of health are separate from those of Inspector of Nuisances, then it is not requisite that the latter shall be conversant with those of the former.

" Before going further, we shall pause and ask the question: If the proposed course of study is required of all candidates for sanitary offices, where, in this State, shall such instruction be obtained? In reply, we may state that it is not at all improbable that one of our State institutions may be induced to provide lectures on at least a portion of the course, while the State Board of Health may give instruction in the remaining branches.

" Further, all reference to purely personal hygiene has been omitted, because that has little to do with the official duties of the Inspector, and the text-books in this department are many and admirable.

"COURSE OF STUDY IN SANITARY SCIENCE.

"*I. Public Health—Sanitary Science.*—Their objects and aims. Definition of terms. Outline of claims and practice. Difference between public and private hygiene. Preventable diseases. The divisions of the subject.

"*II. Sanitary Administration.*—State laws relating to the public health. Organization of the State Board of Health. The powers and duties of the same. Organization of Local Boards of Health. Powers and duties—(1) as to nuisances; (2) as to adulterated food; (3) as to epidemic diseases; (4) quarantine and isolation; (5) animals; (6) registration; (7) inspection of houses, jails, &c.; (8) plumbing; (9) water-supply; (10) burials. Powers and rights of Board. Rights of the citizen.

"*III. The Air.*—Composition. Attributes of ingredients. Temperature. Influence on health. Air pressure. Moisture. Climate. Analysis of air, chemical and microscopic. Pollution of air by gases of decay, by effluvia of factories.

"*IV. The Soil.*—Attributes. Composition. Porosity. Moisture. Temperature. Ground-air. Ground-water. Influence of pollution.

"*V. Water.*—Chemical and physical properties. Source. Kinds and characters. Requirements of potable water. Mineral and organic ingredients. Rivers, pollution. Wells, pollution. Cisterns, pollution, causes, characters, effects, prevention. Ice pollution. Lead-poisoning. Sanitary analysis. Microscopic examination.

"*VI. Food.*—Adulteration, and its prevention.

"*VII. Habitations.*—Site, construction, material, ventilation, heating, lighting. Disposal of waste. Plumbing. Tenements.

"*VIII. Restriction of Disease.*—The germ theory. Zymotic diseases. Contagious and infectious diseases. Methods of restricting disease. Vaccination. Disinfection.

"*IX. Vital Statistics.*—Laws relating to. Births. Marriages. Deaths. Classification, tabulation. Calculations of rates.

"*X. Tabulation of Inspections.*—Inspections of houses, wards, streets, &c.

"In conclusion, we would state that only the briefest outlines are given, but enough has been written to show the subjects that the sanitary officers should be conversant with.

"We hope that steps will be taken by the Association to induce one of the State institutions to provide a course of instruction, and that the question of requiring a certificate in sanitary science, as a prerequisite for all applicants for positions under our health laws, will be discussed.

"Respectfully submitted,
"WM. K. NEWTON,
"HENRY MITCHELL,
"*Committee.*"

Prof. J. M. Green spoke of the importance of having educated Inspectors, but how could we secure them for the amount of salaries usually paid?

Dr. Quimby said in Jersey City $1,200 per annum is paid.

Dr. Hunt referred to the plan suggested and of the necessity of looking to the future, but we must remember that it takes time. England took forty years to reach this. We should certainly expect that in a few years we can secure Inspectors properly educated. Certainly all large cities must have intelligent Inspectors.

Prof. Watson was delighted with the report; it was timely. He hoped it would soon be required in small rural places. He thought Inspectors should be paid as much as public teachers.

Dr. Mitchell thought our State should take the initiative in this matter, and that others would be sure to follow. The carrying out of the plan suggested in the report would certainly accomplish great good.

After further discussion, the report was approved and referred to the Executive Council, to take such action as they may deem expedient.

EVENING SESSION.

President Henry Mitchell, M.D., delivered the annual address, on "The Sanitary Necessity for the Control of the Construction of Dwellings."

(See page 55 of this report for Dr. Mitchell's address.)

The thanks of the Association were voted to Dr. Mitchell for his able address, with the request that he furnish a copy for publication.

THE HYGIENIC ARRANGEMENT OF SCHOOL TASKS.

Prof. W. B. Ireland, of Asbury Park, was then introduced and read a paper on "The Hygienic Arrangement of School Tasks."

After some preliminary remarks he considered the question as to the age at which children should begin to attend school. He did not believe in fixing it at five years of age, as is done in our present school laws, placing our little ones at that tender age upon hard benches with straight, unyielding backs, there to sit with their little feet dangling six inches from the floor for five or six hours. He thought seven years should be the lowest limit. That if we could by some occult process look into the little busy brain of a child between the ages of three and seven, and see the tremendous lessons he is learning each day, we would hesitate before attempting to cram book lore into the already too active and overcrowded brain. He hoped that New Jersey would follow the wise example of some of her much younger sister States in the West. Yet, while waiting, he would urge that as far as possible, we model the work of younger classes according to kindergarten methods. We should have *no* "*tasks*" for children under seven. Then he suggested that it would be well could the mental and physical development of the child be considered in arranging the tasks. He believed in the reduction of books if not of studies. Too many people gauge the progress of adolescents by the number of books they lug daily to and from school, failing to distinguish between the teaching of ideas and the teaching, so-called, of books.

He referred to Prof. Johnson's maxim, "Every increment of food presupposes a corresponding increment of growth, and every increment of exercise, a corresponding increment of strength," and applied them to both physical and mental development, dwelling at some length on the importance of properly adjusting the mental and physical training of children. He was glad to see the indications that the leading educators are beginning to realize that we have been teaching *books* rather than *ideas*, and live, progressive teachers are earnestly seeking to repair the mischief. Prof. Ireland next dwelt upon the results growing out of the luncheon recess, which lasted usually about one hour, drawing a picture of the child hurrying home, eating, or rather, bolting his food, hurrying back again, to apply himself to some severe mental task. He suggested that younger pupils, say from seven to ten years old, should have half-day sessions, from 9 to 12 o'clock, and older pupils who can endure two sessions, and who live remote from the school, should bring luncheon and partake of the same in a room set apart for that purpose.

He spoke of the dangers to health from scholars wearing rubber boots and overshoes and keeping them on all through the school sessions; also of the lack of ventilation in many school buildings and school-rooms.

In closing, he made the following propositions:

1st. The heavier studies, requiring the exercise of judgment, calculation, &c., namely, mathematics, down to the lowest grades of number work, certain of the natural sciences, as physics, chemistry, &c., should have their place in the morning hours, when the pupil, having been refreshed by a night of rest and sleep, is better able to combat with these more difficult studies. Such memory-studies as history, and the semi-mechanical, as writing and drawing, may be left to the later hours of the day.

2d. Exercises should be so varied or alternated that a constant strain should not be brought to bear on one single faculty, *e. g.* a recitation requiring an exercise of the reasoning powers, as mathematics, should be followed by one bringing in play only the memory. An exercise straining the eye and cramping the chest, as writing too often does, might be followed by a purely oral recitation, &c.

The discussion of Prof. Ireland's paper was opened by Hon. E. O. Chapman, of Trenton. He thought the subject was very broad and important. If the school tasks be not distributed according to the laws of health, great mischief will be done. He thought we should give up the word "tasks" in connection with the school-life of childhood. It is the growing-time—mentally, it may be, physically, it certainly should be. It should be a pleasure for the young child to attend school. All school training should be pleasurable, not arresting development in any direction. We should not forget the necessity for the development of the physique, while we strive to develop the intellectual faculties. He esteemed it a very encouraging fact that a time is set apart for the discussion of these points in the annual meeting of our Sanitary Association. We should do away with the idea that schools are only to make scholars, but to make true men and women in every sense of the word. While agreeing with Prof. Ireland in the main, he did not believe in changing the law which fixed the school age at five years. The inquiring mind at five years should be trained; he feared that at seven years faulty habits would be formed which would be hard to eradicate. Let us not, however, put on them "tasks," place them on hard, uncomfortable benches, and give them difficult books, but fit the school-room duties so as to make the work easy and pleasant. He would not put books into the hands of young children in the school-room, so as to make it irksome and difficult. Books are indispensable, but they have been so much improved that many teachers depend upon them too much. Teachers recognize the difficulties and are trying to secure less book knowledge and more development. What can we as sanitarians do in the premises? The parents too generally are ignorant of hygienic requirements, insisting that their children shall carry back and forth to school a pile of books and undertake too many studies. The members of this Association can help to instruct parents and the public, and point out the danger of error in sanitary law.

Prof. J. M. Watson said he believed that the period when training should begin was at the birth of the child, but the great difficulty is that in our large cities, and in many other places, parents are not fitted for training their children; they needed instruction. All books placed in the hands of children should be pleasurable, imposing no tasks. He illustrated how, in mental training, we use comparisons which the child is so apt to understand. All books for young children should be made to please them, and if we have not such books, we ought to have them. He would not keep the young child on a single lesson for any length of time, but give him change, and frequent change. Idleness is not true rest, but change of thought and occupation. He would emphasize that no child or man can ever be developed by mere mental or by mere physical training, but by mental with physical. Train all the faculties symmetrically.

SECOND MORNING SESSION.

The meeting was called to order by President Mitchell, at 9:30 o'clock.

Prof. F. A. Wilber, of New Brunswick, was introduced and read a paper on "Water-Supply from Wells in Relation to Health."

The Professor presented and explained several diagrams showing the various ways in which the water in wells had been contaminated, several of them representing wells in various places that had been examined and condemned.

Dowling Benjamin, M.D., of Camden, briefly opened the discussion on the paper, saying that it was a clear and correct presentation of the question, and that it was so plainly put that it would be a most excellent paper for distribution among the people.

Mr. Pumpelly asked Professor Wilber if he would not condemn every well in a town with a closely-settled population.

Prof. Wilber replied that he would have to know all the conditions before he could intelligently answer in the case of any town. He thought we ought to be careful of condemning any well before careful examination was had of the water and the surroundings of the well. We should make no statements concerning the positive impurity of any water which we are unable to prove.

Dr. T. W. Harvey, of Orange, spoke of the process of nitrification, and argued that downward filtration will, in time, affect the soil.

Dr. E. M. Hunt believed we should know all the conditions affecting our water-supply from wells. The Gilbert experiments were stated by Prof. Wilber pretty strongly. Certain soils do cleanse very rapidly. He thought it was mainly a question of strata. He felt the subject of great importance and very opportune, as wells are greatly injuring our people.

E. G. Harrison, C.E., of Asbury Park, related instances where oil passed through a clay soil and polluted a well.

COMPARATIVE VALUE OF TESTS FOR DEFECTIVE PLUMBING.

The next subject considered was "Comparative Value of Tests for Defective Plumbing."

In the absence of J. C. Collins, Esq., of New York city, President J. C. Bayles, of the New York City Board of Health, who had been requested to take his place, was introduced and spoke at some length on the subject. He dwelt on the necessity of thorough inspection of plumbing-work and of the success some dishonest plumbers had had in covering up bad work, which made it necessary to employ mechanical and automatic tests. They found a large proportion of the pipes themselves defective, having more or less cracks and minute holes. He said that it was not until within a few weeks they had been able to buy tested pipes. One of the tricks had been to cover the little pin-holes or cracks with moistened bread and cover it over with tar. The first step was to forbid the use of tarred pipes. This worked well. Then it was deemed necessary to have mechanical tests made by the plumber before the Inspector. The matter was brought before the Plumbers' Association, and they finally agreed to a test of 5 pounds to the square inch.

The methods of testing suggested by him were—(1) by ether, which proved too delicate; (2) by hydrogen, which was good, but inconvenient, and the odor may mislead; (3) smoke, which promised well—a machine was invented in the West for forcing smoke into pipes, but it does not give enough pressure; (4) air or water—they are equally good, about one-half are tested by each. Air is best applied by a gas-fitter's pump; the air whistles when there is a hole and a current. Sometimes a coating of soap is put over the pipe, and the bubbles forming over the cracks or holes tell the tale when the air is forced in the pipes. Water is probably best for all purposes. (See page 50.)

The air test must be 10 pounds. Some recent work has been subjected to 27 pounds. In the new *Times* Building, New York city, a vertical pipe of 200 feet gave no leakage. Houses are tested, as a whole, on this system. All buildings will hereafter be tested. The plumbers used to suffer many inconveniences by bad pipe. Now, companies are compelled to test pipe. The result is, that the best men must do the iron-work. The plumbers of New York now buy nothing but tested pipe; the untested pipes go mostly to New Jersey.

In reply to a question by Dr. Hunt, Mr. Bayles said that any pressure of water on good pipes will not be injurious, but it is true that if there are great leaks, its use in furnished houses would not do.

The subject was further discussed by Prof. C. McMillan, of Princeton; J. S. Wetmore, Esq., of Englewood; Dr. Benjamin, of Camden; Dr. Hunt, of Trenton, and Dr. Henry Mitchell, of Asbury Park.

PREVENTION OF THE SPREAD OF CONTAGIOUS DISEASES.

President J. C. Bayles then delivered an able address on "Means for Preventing the Spread of Contagious Diseases in Cities." He gave a detailed statement of the workings of the New York City Board of Health in this direction showing the thorough system and practical results there obtained.

(See page 179 of this report for Mr. Bayles' address.)

Dr. E. M. Hunt spoke of the amount of work performed by and the success attending the administration of the New York City Health Board as remarkable, and of the satisfaction it afforded us as an Association, of having one of our own members and a former President of this Association, at the head of the Health Board that was accomplishing so much good in New York.

Dr. Benjamin spoke of the clear and practical presentation of the work done, and believed it was a model for Boards of Health. He moved the thanks of the Association be tendered to President Bayles for this exceedingly instructive address, and that a copy be requested for publication. Which motion was unanimously adopted.

The Secretary reported from the Executive Council the following nominations of officers for the ensuing year, who were unanimously elected:

President, Dowling Benjamin, M.D., of Camden.
First Vice-President, George P. Olcott, C.E., of Orange.
Second Vice-President, Jacob S. Wetmore, Esq., of Englewood.
Recording Secretary, David C. English, M.D., of New Brunswick.
Corresponding Secretary, Prof. J. Madison Watson, of Elizabeth.
Treasurer, George W. Howell, C.E., of Morristown.

EXECUTIVE COUNCIL.

(With above-named officers.)

J. C. Pumpelly, of Morristown, Chairman.
William Elmer, M.D., Bridgeton.
Hon. E. O. Chapman, Trenton.
William Pierson, M.D., Orange.
E. S. Atwater, Counselor-at-Law, Elizabeth.
Prof. W. B. Ireland, Asbury Park.
C. Phillips Bassett, C.E., Newark.
Shippen Wallace, Ph.D., Burlington.
A. Clark Hunt, M.D., Metuchen.
E. L. B. Godfrey, M.D., Camden.
Prof. Chas. McMillan, C.E., Princeton.
Rev. Dr. A. E. Ballard, Ocean Grove.
T. R. Chambers, M.D., Orange.
Prof. F. A. Wilber, New Brunswick.
E. G. Harrison, C.E., Asbury Park.
A. P. Hunt, M.D., Somerville.
Herbert B. Baldwin, Newark.

The President appointed as the Committee on Legislation:

E. S. Atwater, Counselor-at-Law, of Elizabeth, Chairman; L. B. Ward, C.E., of Jersey City; E. M. Hunt, M.D., and Hon. E. O. Chapman, of Trenton; G. D. Saltonstall, M.D., of Hoboken; J. S. Wetmore, Esq., of Englewood, and Rev. Dr. A. E. Ballard, of Ocean Grove.

Dr. F. Gauntt offered a resolution recommending the establishment of a Biological Laboratory by the General Government. It was adopted.

After the transaction of some other items of business the fourteenth annual meeting adjourned. The general feeling of the members present was that this had been the most interesting and profitable of the entire series of meetings, and that the outlook for the future in matters of sanitation was brighter than ever before.

MEMBERS OF THE ASSOCIATION.

The following are the names now on the roll of the Association:

ASBURY PARK.

David Harvey, Jr., Attorney,
Prof. W. B. Ireland,
Isaac C. Kennedy, C.E.,
Dr. Henry Mitchell,
W. D. Pennypacker,
Randolph Ross,
Dr. J. H. Shotwell,
Uriah White.

ATLANTIC CITY.

Lewis Reed, Jr.

BAYONNE.

F. N. Barrett.

BELLEVILLE.

Dr. D. M. Skinner.

BLACKWOODTOWN.

Rev. F. R. Brace.

BLOOMFIELD.

Dr. Joseph A. Davis.

BOONTON.

Dr. J. G. Ryerson.

BOUND BROOK.

Lewis D. Cook.

BORDENTOWN.

Dr. W. H. Shipps.

BRIDGETON.

Dr. William Elmer.

BURLINGTON.

Dr. Franklin Gauntt,
F. W. Millner,
Nehemiah Sleeper,
Shippen Wallace, Ph.D.

CAMDEN.

Dr. Dowling Benjamin,
Hon. H. L. Bonsall,
Louis T. Derousse,
Dr. E. L. B. Godfrey,
Dr. E. M. Howard,
Dr. W. H. Iszard,
C. Henry Kain,
E. Read, Jr.,
Daniel Strock, M.D.

CAPE MAY CITY.

Dr. Henry A. Kennedy,
Dr. James Mecray.

DEMAREST.

William E. Davies.

DOVER.

Dr. T. R. Crittenden.

ELIZABETH.

E. S. Atwater, Counselor-at-Law,
Dr. G. W. Bailey,
Samuel Bonnell,
Prof. J. Aug. Dix, Superintendent,
Rev. Otis A. Glazebrook,
Rev. Carter H. Jones,
R. V. Lindabury,
Dr. W. A. M. Mack,
Dr. E. K. Morton,
Dr. E. R. O'Reilly,
A. R. Reeve,
Dr. Thomas Terrill, Jr.,
Prof. J. Madison Watson,
Dr. Robert Westcott,
Dr. N. L. Wilson,
James C. Woodruff.

ENGLEWOOD.

Henry Jones,
Jacob S. Wetmore.

FARMINGDALE.

Dr. S. M. Disbrow,
A. A. Yard.

FORT LEE.

Dr. Alex. Clendenin.

FREEHOLD.

Dr. D. McL. Forman,
Rev. Samuel Lockwood, Ph.D.,
Dr. I. S. Long.

GLASSBORO.

Dr. J. Iszard.

GLOUCESTER CITY.

J. A. Warnsley, M.D.

GOSHEN.

V. O. Miller.

HACKENSACK.

Dr. A. S. Burdett,
Wm. Williams, C.E.

HIGHTSTOWN.

F. D. Budlong,
Dr. Lloyd Wilbur.

HOBOKEN.

Charles B. Brush, C.E.,
Prof. A. R. Leeds, Ph.D.,
Thomas H. McCann, C.E.,
Dr. Louis Mitchell,
Dr. G. D. Saltonstall.

HOLLY BEACH.

M. L. Harrison.

HOPEWELL.

John Fleming.

IMLAYSTOWN.

Dr. H. G. Norton.

JERSEY CITY.

Dr. A. G. Avery,
E. W. Harrison, C.E.,
Dr. J. W. Hunt,
John Kase, Jr.,
Hon. John A. McGrath,
Hon. E. T. McLoughlin,
Dr. Wm. H. Newell,
Dr. I. N. Quimby,
Lebbeus B. Ward, C.E.,
Conrad Wienges, M.D.

KEY EAST.

E. G. Harrison, C.E.

KEYPORT.

Dr. J. C. Arrowsmith.

LAMBERTVILLE.

Amos Smith.

LEBANON.

Supt. O. H. Hoffman.

LONG BRANCH.

R. J. Andrews,
Prof. Wright Eckersly,
Prof. James M. Green,
Dr. S. H. Hunt.

MATAWAN.

Dr. S. J. Bartlett.

METUCHEN.

Dr. C. H. Andrus,
Dr. A. Clark Hunt.

MIDDLETOWN.

E. A. Osborn, C.E.

MONTCLAIR.

Samuel Crump,
E. J. Huestis,
C. H. Johnson,
Dr. John J. H. Love,
James Owen, C.E.,
Dr. J. W. Pinkham.

UPPER MONTCLAIR.

Dr. Morgan W. Ayres.

MORRISTOWN.

George W. Howell, C.E.,
Josiah C. Pumpelly.

NEWARK.

Dr. H. J. Anderson,
Herbert B. Baldwin, Chemist,
Prof. H. W. Barringer.
C. Phillips Bassett, C.E.,
Dr. Laban Dennis,
Hon. Joseph E. Haynes,
Dr. P. V. P. Hewlett,
Dr. C. F. J. Lehlbach,
Dr. F. B. Mandeville,
Wm. O. McDowell,
Dr. E. P. Niehols,
Dr. J. D. Osborne,
Dr. D. L. Wallace,
Dr. Alex. Wilder,
Durand Woodman, Ph.D.,
Dr. Charles Young.

NEW BRUNSWICK.

Prof. P. T. Austen, Ph.D.,
Dr. Henry R. Baldwin,
Prof. Geo. H. Cook, Ph.D..
Dr. F. M. Donohue,
Dr. D. C. English,

Merrill E. Gates, LL.D.,
Prof. Charles Jacobus,
McRee Swift, C.E.,
Dr. Charles H. Voorhees,
Prof. F. A. Wilber,
Dr. Nich. Williamson.

NEW DURHAM.

Abram W. Duryea,
Edward Lennon,
Charles Pinnell.

OCEANIC.

E. Parmly.

OCEAN GROVE.

Dr. J. H. Alday,
Rev. Dr. A. E. Ballard.

OCEANPORT.

Dr. E. W. Crater.

ORANGE.

James C. Bayles, M.E.,
Dr. Thomas W. Harvey,
George P. Olcott, C.E.,
Wm. Pierson, M.D.,
Dr. G. W. Richards,
Dr. J. Y. Simpson,
Dr. Stephen Wickes.

EAST ORANGE.

Dr. T. R. Chambers,
J. G. Thorp,
Philemon Woodruff.

SOUTH ORANGE.

Daniel T. Clark,
Dr. A. A. Ransom.

PASSAIC.

John B. Pudney,
F. H. Rice, M.D.

PATERSON.

John T. Hilton, C.E.,
Dr. W. S. Hurd,
Dr. John L. Leal,
Dr. Elias J. Marsh,
Dr. E. S. McLellan,
Prof. C. E. Mellany,
Dr. William K. Newton,
Dr. James W. Smith,
Dr. A. R. Wolfe.

PENNINGTON.

Dr. E. L. Welling.

PERTH AMBOY.

Hon. William Paterson.

PLAINFIELD.

Dr. W. C. Boone,
Dr. C. M. Field,
Dr. Joseph R. Platt.

PRINCETON.

Prof. C. F. Brackett, LL.D.,
Prof. H. B. Cornwall,
Prof. William Libbey, Jr.,
Prof. Charles McMillan, C.E.,
E. C. Osborn.

SOMERVILLE.

Dr. A. P. Hunt.

SOUTH AMBOY.

Dr. A. Treganowan.

SUMMIT.

Dr. W. H. Risk,
Alex. A. Taylor.

TENAFLY.

Dr. Milton Turnure.

TITUSVILLE.

Ira J. Blackwell.

TRENTON.

Dr. F. V. Cantwell,
Hon. E. O. Chapman,
Dr. Isaac Cooper,
Dr. William Elmer, Jr.,
Edward W. Evans,
Prof. W. Hasbrouck,
Dr. Ezra M. Hunt,
F. C. Lowthorp, C.E.,
Dallas Reeve,
Dr. J. I. B. Ribble,
Rt. Rev. J. Scarborough,
Dr. Cornelius Shepherd,
Dr. John W. Ward,
Dr. David Warman,
Isaac Wetherby,
Dr. H. G. Wetherill,

WAVERLY.

Hon. Peter T. Quinn.

WESTFIELD.

Dr. J. B. Harrison.

SUMMARY OF REPORTS FROM LOCAL BOARDS

AND LISTS OF MEMBERS AND HEALTH INSPECTORS, WITH ABSTRACTS FROM MOST OF THE REPORTS.

BY THE SECRETARY.

In October in each year, as required by law, a printed schedule of inquiries is sent to each Local Board of Health, also containing a blank for the names and post-office address of members of the Local Boards and Sanitary Inspectors.

The following is the schedule of subjects:

SUBJECTS FOR REPORT.

A. Location, population and climate.
B. Geology, topography and contour.
C. Water-supply.
D. Drainage and sewerage.
E. Streets and public grounds.
F. Houses and their tenancy.
G. Modes of lighting.
H. Refuse and excreta (how managed).
I. Markets.
J. Diseases of animals.
K. Slaughter-houses and abattoirs.
L. Manufactories and trades.
M. Schools and school and other public buildings.
N. Alms-house, hospitals and other charities.
O. Police and prisons.
P. Fire-guards or escapes.
Q. Cemeteries and burial.
R. Public-health laws and regulations.
S. Registration and vital statistics.
T. Quarantine or care over *contagious* diseases, and vaccination.
U. Sanitary expenses.
V. Heat and ventilation for dwellings.
W. Prevalent diseases of the year.

Other subjects may be named under X, Y, Z. The subjects may thus be referred to by the letters.

If the sheet provided is not sufficient, add others, marked with the letters which designate the topic treated.

If details on some of the subjects named have been furnished in former reports, these do not need to be repeated. But each item should be carefully examined and full information given under R. It is always best to state what the Board has actually done. Under W no disease should be reported as having been prevalent unless the writer knows of at least ten cases. The medical member of the Board should, if possible, give facts as to any epidemic that has occurred, and should note any special needs or defects in sanitary administration.

We do not find it necessary to publish all of each report, and even those from which we publish nothing are of value for reference in the office. Our space permits us only to select such parts as are new, or as are of special interest to the locality and to this Board. Reports are in general promptly received, but a few Boards are dilatory or seem to regard the report as a formality. We regard them as so important that we must insist upon exact conformity to the law. Those who will examine the abstracts will not fail to get valuable information and have opportunity to compare the work and methods of the various Boards.

LEGAL OPINION.

The following questions as to legal points have been answered thus by Judge Wm. M. Lanning, of Trenton:

First. Is a borough located within the limits of a township and in which no Local Board of Health has been organized, subject to the jurisdiction of the Local Board of Health of the township in which the borough is situate?

It is not. The latter part of Section 10 of the Health act expressly provides that "in any township within whose limits a city, borough, town or other form of local municipal government now exists, or hereafter shall exist, the jurisdiction of the Local Board of the township shall extend *only* to such parts of the township as are, or shall be, outside of the territorial limits of such city, borough, town or other local municipal government."

Second. May a physician residing in a borough located within the limits of a township, and in which the borough taxes and township taxes are assessed at the same time and by the same officer, be appointed as a member of the Local Board of Health of the *township?*

I think he may. Section 10 of the Health act provides that the Township Committee, the Township Assessor and one physician to be appointed by the Township Committee, shall constitute the Local Board of the township. If the Assessor or a member of the Township Committee should reside within the limits of the borough, it is clear that that fact would not render him ineligible as a member of the Township

Board. If residence within the borough does not disqualify an Assessor or a member of the Township Committee, there is no reason for holding that it should disqualify a physician.

Third. Is it within the power of the Legislature to extend the provisions of the supplement to the Health act relating to plumbing, passed February 22d, 1888, to townships having a population of 2,000 or more?

This question is not easy to answer. The opinion of the Court of Errors in the High License-Local Option law, lately rendered, might possibly be cited as an authority for the exercise of such a power. I think a safer plan would be to extend the provisions of the Plumbing law to those townships in which the density of population exceeds a certain number per square mile, or to those townships which now have, or may hereafter have a public water-supply.

NOTE.—A Township Board is a legal Board without a physician upon it, but it is always best to have a medical member, if there is one residing in the township. If the Local Board does not in such case appoint one, this Board can and generally does. We get our information direct or from the annual report. The office of Township Physician, where there is such an office in the township, does not make the person a member of the Board of Health, but a medical member of the Board is such by appointment. He must reside in the township, but can be a member of a Township Board if he resides in any borough or town of the township in which the Assessor of the township levies tax.

ATLANTIC COUNTY.

ATLANTIC CITY.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Joseph H. Borton, President, Atlantic City; George W. Sheppard, Secretary, Atlantic City; Edward S. Lee, Atlantic City; Samuel B. Rose, Atlantic City; Jacob H. Leedom, Atlantic City; Eugene L. Reed, Atlantic City; William Read, Atlantic City. Lewis Reed, Jr., Health Inspector.

Atlantic City is situated on the southeast coast of the State of New Jersey, Lat. 39° 22′ N., Long. 74° 28′ W. Population, 12,000 permanent; from 40,000 to 50,000 summer population. In winter, 8 to 10 degrees warmer than 50 miles inland; in summer the same number of degrees cooler than inland, due to the prevalence of sea-breezes during that season.

Atlantic City Water Company get their supply from Doughty's mill-pond and a number of wells of about 50 feet in depth. Consumers' Water Company, artesian well, 1,250 feet deep, pumps 900 gallons a minute, with another well sinking, now at the depth of 800 feet. Some residents still use cisterns.

Rainfall led off by underground trunks and surface gutters leading to creek on meadows, and sewerage by means of the West system of underground drainage.

Streets are gravel, paved and well kept.

As a rule, not more than one family to a house.

Most houses connected with sewer; those not, with brick vaults, cleaned by odorless excavator. Refuse taken to the mainland.

We have four large school-houses, which accommodate about 2,000 school children. Well ventilated and heated.

All hotels have fire-escapes.

All of the usual precautions taken by the Board of Health.

(Signed) LEWIS REED, JR.,
Health Inspector.

BUENA VISTA TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Benjamin Stoepplewerth, Hammonton; George B. Cake, Landisville; Oreste Repetti, Vineland; John Faux, Vineland. There is no resident physician in the township.

Wells are the only source of water-supply.

There is no system of drainage other than the natural. No sewers. No malaria. Cellars generally dry.

Houses generally have cellars. Vegetables are stored in them in winter. No tenement-houses in the township.

No sewers; cesspools and dry earth closets are in use; very few cemented. Contents used for manure.

No diseases prevalent. The Assessor does inquire as to diseases of animals and losses, and as to contagious diseases.

No slaughter-houses in the township.

No manufactories.

There are five public school-houses and two churches in the township, all in good repair.

One burying-ground in the township.

No township laws in reference to public health.

(Signed) JOHN FAUX,
Assessor.

EGG HARBOR CITY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John J. Fritschy, Egg Harbor City; Moritz Rohrberg. Egg Harbor City; Joseph Fecher, Egg Harbor City; Francis Norman, Egg Harbor City.

Our water-supply is obtained from driven wells, from thirty to forty feet deep. The water is of a good quality. We have no other system of drainage than surface drainage, but the natural facilities are good. Nearly all houses have cellars and the cellars are all dry.

No diseases prevailed during the past year and the general health of the city is good. Only four complaints of nuisances were made to the Board during the past year. Upon notice, the nuisances were promptly abated. The sanitary condition of the city is satisfactory.

(Signed) F. NORMAN,
Secretary.

EGG HARBOR TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. R. M. Sooy, Pleasantville; Isaac Andrews, Pleasantville; John T. Lake, Pleasantville; Dr. Sherman De Mill, English Creek; John I. Carson, Bargaintown. J. W. Smith, Health Inspector, Bargaintown.

There is but little change from what has been formerly reported.

A new ordinance has been passed. Refuse and garbage are handled in quite a satisfactory manner, there being no complaints or trouble during the past year.

The people are becoming educated to the sanitary requirements of the Board of Health.

There have been a few cases of typhoid fever, which were sporadic.

Infantile diarrhœa was rather more prevalent or virulent than formerly.

GALLOWAY TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Joseph Sahl, Pomerania; William Robinson, Port Republic; Abram Anderson, Leeds Point; John F. Mathis, Leeds Point; William Parsells, Absecon; Mark S. Somers, Oceanville. Dr. E. H. Masten, Health Inspector, Absecon.

Water-supply by wells, mostly.

Sufficient drainage; water is level; most all cellars dry.

Houses generally have cellars, used to some extent for storing vegetables. Very few houses occupied by more than one family.

No sewers used.

HAMILTON TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Peter Murdoch, Weymouth; Charles Crowell, Mays Landing; Daniel E. Izzard, Mays Landing; Lewis W. Cramer, Mays Landing; Carles T. Abbett, Mays Landing; D. B. Ingersoll, M.D., Mays Landing. Andrew G. Stewart, Health Inspector, Weymouth.

Our water-supply is chiefly from wells, and these in some tenement-houses are so poorly kept as to call for investigation, as often in summer season they are the receptacles of toads and other filth. In no case should a house be rentable unless supplied with a good well of water.

There have been no changes made in drainage and sewerage since last report.

We must again urge that if there is no law now in regard to the poorly-kept houses for rent, that it should be passed forthwith to require all houses for rent to be placed in a sanitary condition. In many instances the poorer class of persons who rent these houses are ignorant of the effect of the want of these sanitary arrangements, and this, and because the landlords savor strongly of the spirit of the landlords of the Emerald Isle.

There have been no diseases of animals this year in our township.

In our schools and school-houses some change is desirable. The houses should be properly heated with *pure air*. Some are heated by hot air; that is, by heaters in the cellars. And this air is drawn from the confined and impure air in the cellar, and taken up into the room, to be inhaled by the pupils. This certainly should be remedied.

And again, of much greater importance, the pupils are required in our school—and I find it to be so generally in the county—to drink water from *one* pail, in which the water is brought from some neighboring well. *One* cup is provided, and each pupil takes up, generally, what the cup will hold, drinks what he desires and pours back into the pail what he fails to drink, and thus the whole bucket of water soon becomes hardly fit to drink.

Sanitary expenses are met by general tax of township, included in "incidentals."

There have been no prevalent diseases during the year. It has been a year of remarkable health.

(Signed) D. B. INGERSOLL, M.D.,
Township Physician, Hamilton Township, Atlantic County.

HAMMONTON.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

James H. Seely, Hammonton; Charles Woodnutt, Hammonton; James P. Patten, Hammonton; A. J. Smith, Hammonton. Edward North, M.D., Health Inspector, Hammonton.

Very little slaughtering now done in the town.

We would report that the Board adopted last summer the code given by the State Board as a model, leaving out one section only, which was not applicable to this town.

One of our difficulties is to get reports of births from our Italian population, which its becoming quite numerous, but think, on the whole, we get nearly all the births.

Nothing of importance to communicate.

(Signed) A. J. SMITH,
Town Clerk.

MULLICA TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jesse R. Abbott, Chairman, Pleasant Mills; Oliver Gee, Elwood; Theodore Weeks, Green Bank, Burlington county.

No Board formed in this township this year.

(Signed) W. S. MILLER,
Assessor.

SOMERS POINT.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

H. H. Vansant, Somers Point; J. H. Vickers, Somers Point.

Somers Point, situated on west side of Great Egg Harbor inlet, bay and river. Population, 400; climate, mild; 1,273 acres.

Water, spring wells, soft and clear.

Drainage, surface; no malaria and no swamps near by.

Houses with cellars used for storage, and no two tenement-houses for families.

Cesspools, half cement and half surface.

No slaughter-houses.

No manufactories.

One school-house, two rooms.

Canvas fire-escapes to hotels.

Two cemeteries.

Laws regulated by council.

No registration.

At present no quarantine necessary.

Sanitary expenses estimated about $5.

Stoves and heaters for heating purposes.

No prevalent diseases, only colds.

(Signed) T. D. VAUGHAN,
Borough Clerk.

WEYMOUTH TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

D. H. Gandy, Tuckahoe, Cape May county; Wm. Campbell, Hawkinsville, Cape May county; Joshua Smith, Estellville; Hiram Godfrey, Tuckahoe, Cape May county. Dr B. F. Abbott, Health Inspector.

The general health of our township for the past year has been remarkably good. We have had no disease of any kind, and very few deaths. Acting as the Assessor of the township, I have a good opportunity of knowing the condition of the people, as I go in almost every house, and have for the last two years made inquiry concerning the health and condition of children in all places where it had any appearance of neglect on the part of the parents. I find the last year one of the most healthy to the inhabitants of the township for many years. Being uncommonly wet and more or less foggy, it was supposed the fall months would bring malaria and fevers of different kinds, but such has not been the case.

Our climate is fine, and we breathe the sea air through the forests, which seems to help to keep us healthy, and is much more healthy than nearer the sea-shore. Our water-supply is from ordinary wells, either dug and bricked or the driven tubular well. Water is soft and fine for either washing purposes or for drinking.

We have no uncommon diseases among our animals.

We have four public schools in the township, with a good attendance, and the children are uncommonly healthy.

We have certainly been blessed the past year with good health.

(Signed) HIRAM GODFREY,
Assessor of Township.

BERGEN COUNTY.

ENGLEWOOD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jacob S. Wetmore, Englewood; James Harris, Englewood; J. N. Brinkerhoff, Englewood; Hardy M. Banks, M.D., Englewood; G. W. Chamberlain, Englewood. E. H. Canfield, Health Inspector.

Englewood, located on the Palisades and in the valley of the Hackensack. Rolling country, with granite and limestone formation. The water is furnished by the Hackensack Water Company and local wells and springs. The latest improved system of drainage is laid, or being laid, through the town. The streets are macadamized and well taken care of by Road Board and Village Improvement Society. Majority of houses occupied by owners. The streets are lighted by local gas company and oil lamps. The refuse, &c., is carried to public dump-ground. The markets are clean and well looked after. All meats are brought from Jersey City and New York, so that there is practically no slaughtering done in the township. Schools are built with all the latest sanitary improvements. A hospital will shortly be built. The town has an efficient fire company, with ample hose, &c. Two cemeteries are under good management and control. The Local

Board of Health is composed of energetic men, who look after the health of the town. The Assessor, who is Clerk of the Board, acts as Register of Vital Statistics. Sanitary expenses are, when necessity arises, obtained from public-spirited citizens. The principal disease for the year is typhoid malaria and other types of this disease.

(Signed) E. H. CANFIELD,
Health Inspector.

FRANKLIN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John Post, Wortendyke; Wm. G. Ackerman, Wortendyke; Albert Lozier, Campgaw; John W. Ackerman, Assessor, Oakland.

HACKENSACK.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

James A. Romeyn, Secretary, Hackensack; J. S. C. Wells, Hackensack; Abraham D. Brower, Hackensack; Lemuel Lozier, Hackensack; Louis Perrott, Hackensack.

Hackensack is situated on the west bank of the Hackensack river, about 12 miles north of New York city. Latitude 40° 53′ N., and longitude 74° 3′ W. from Greenwich.

At a rough estimate it includes about 2,000 acres. Population of from 6,000 to 7,000. Climate agreeable though variable. Notable for the health and prosperity of the people.

Beautifully located in a pleasant valley, through which flows the Hackensack river, in which the tide rises and falls 4 to 5 feet.

Water-supply ample; obtained from the Hackensack river, above the influence of the tide or navigation; supplied by "Hackensack Water Company, Re-organized." The same source also supplies Englewood and Hoboken. Supplied by a reservoir at an elevation of 110 feet above the town. The reservoir, however, only takes the back-water, as the pumping supply is sufficient. Water rarely discolored. Possibly an iron taste. Neither soft nor hard; medium. At no special season of the year is it bad to taste or discolored, but at times it has a fishy taste, which is said to be due to a peculiar weed. No sewage above the supply. A good many wells are used, but few cisterns.

Sewerage well arranged. Several thousand feet of sewer has been laid, the river giving a good outlet for all draining purposes. The system is composed of large brick sewers as outlets, with pipe laterals. There are some ditches for draining, and one creek which is used for sewage, which the Board of Health has ordered discontinued, and an ordinance is in force to stop further use. Cellars generally dry. On the south are salt-meadow swamps, but malaria is not frequent, few cases of it being known.

Streets worked to established grades, curbed and guttered, and sidewalks good. Some Macadam pavement.

Many houses occupied by the owners. Very few houses are occupied by two or more families. Few basements; mostly cellars. It is safe to say that vegetable matter is not generally stored in cellars.

Gas generally used for lighting.

Refuse and garbage, &c., removed by scavengers, and excreta by an odorless excavating company. Sewers are generally used. Cesspools must be laid up with cement and made water-tight. Some old ones are open at bottom; emptied by scavengers or by odorless company.

No general markets.

No epidemic among animals has existed.

No slaughter-houses, save where butchers occasionally kill. These places are inspected and kept clean.

The manufactories consist of silk mill, brick-yards, and silver works.

School buildings well ventilated and heated. They are under the most skillful management. Two large buildings of the most improved kind heated by steam, both direct and indirect. One smaller school-house heated by stoves, but in good condition. Our school buildings are in every way A No. 1.

The alms-house not in town. One hospital with 16 to 20 beds. Township care for poor, besides other charities in this line cared for by the churches and ladies' aid societies.

A small uniformed police force. An excellent county jail, well ventilated and drained into the creek.

A regularly-organized fire department with improved apparatus. The water-supply has force enough to throw over the highest building. An electric fire alarm, with street signal boxes, and a good alarm bell.

An old cemetery exists in the town, which is still being used; the new ones are beyond the limits.

A Board of Health doing good work. All complaints are promptly attended to by the Inspector, and reports given to the Board.

Board of Health has sanitary supervision of the town.

The expenses have been from $250 to $300, so far.

Dwellings are heated by steam, furnaces, stoves, &c.

No epidemic, and very few contagious or infectious diseases.

(Signed) J. A. ROMEYN,
Secretary.

HARRINGTON TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Abram K. Knight, Chairman, Closter; Jacob J. Demarest, Secretary; John H. Mence, River Vale; Barney N. Ferdon, Closter; H. A. Crary, Closter.

The foregoing persons constitute a Board of Health for the township. We have no incorporated towns within the township; two small villages. The houses for the most part are occupied by the owners, and where there are two families in a house, one is the owner. No part of the township is supplied with water from any stream for potable use, but every house has either a cistern or well, or both. There are a few cellars that have water in very rainy seasons of the year. The health of the people has been very good. Some malaria, but not to any great extent. There have been several deaths from diphtheria, but the cases were all confined to the families where it first appeared. The physicians have, during the year, up to the present time, been very prompt in filling out blanks and reporting births, deaths, &c., to the Assessor.

(Signed) JACOB J. DEMAREST,
Assessor.

HOHOKUS TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Lewis Henry May, Ramseys; John Ackerman, Ramseys; Abram Banta, Mahwah; W. H. Murray, Assessor.

LODI TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

James Van Bussum, Chairman, Garfield; John Van Bussum, Assessor and Secretary, Corona; Charles Mathe, Carlstadt; Henry Stromeyer, Little Ferry; Dr. Martin Tygert, Township Physician, Carlstadt.

The water-supply is from wells, cisterns and springs.

There is no drainage or sewerage.

The streets are generally in good condition; there are no public grounds.

Houses are generally occupied by their owners, and mostly built with cellars for the storage of vegetables.

Kerosene oil is mainly used for lighting.

Refuse and excreta are used to sustain domestic animals and to fertilize the soil.

There are no markets.

No diseases have been prevalent among animals.

There are no slaughter-houses.

There are no manufactories causing evils to health.

There are six schools, fairly prosperous, and school-houses in good condition; no other public buildings, unless churches are so considered.

No alms-houses, hospitals or other charities.

No police or prisons.

There are two or three well-organized fire companies.

There are two cemeteries.

Health laws and regulations altogether under the control of the Township Board of Health.

Registration and vital statistics under the care of the Assessor, and are forwarded monthly to Trenton.

One case of small-pox has occurred; proper efforts were made, and successfully, so as to prevent contagion.

Sanitary expenses, as yet, have received no attention.

Houses mostly heated by stoves, and ventilation generally obtained by doors and windows.

There has been no prevalent disease.

(Signed) JOHN VAN BUSSUM,
Secretary.

MIDLAND TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

L. Hague, Oradell; H. W. Winters, Oradell; J. R. Oldis, Rochelle Park; John C. Van Saun, Assessor, Maywood.

The township of Midland is situated in the county of Bergen and State of New Jersey; it has 9,530 acres.

The water-supply comes from wells and cisterns and two rivers.

Drainage is natural.

Houses generally have cellars; largely used for storage of vegetables.

No system of sewerage.

Do not know of any prevalent disease.

No slaughter-houses in township.

No new manufactories.

ORVIL TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles W. Badeau, Allendale; B. O. Blenis, Saddle River; Elijah Rosencranze; Hohokus; George B. Smith, Allendale; Abram H. Ackerman, Assessor, Saddle River.

Water-supply—natural streams, wells and springs. The streams are all running water.

Drainage natural, except a few bog-swamps, which are drained by ditching.

Houses about all have cellars, which are largely used for storing vegetables; not any tenement-houses for more than two families.

A few cesspools; contents used as fertilizer.

No prevalent diseases. It has been unusually healthy in the township this year.

No slaughter-houses in township.

One woolen and one cotton mill; no injury to health from them.

(Signed) Abram H. Ackerman,
Assessor.

PALISADE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Milton Turnure, M.D., Tenafly; John H. Huyler, Tenafly; Alfred Jarvis, Tenafly; N. C. Demarest, New Bridge; J. H. Anderson, Schraalenburg.

RIDGEFIELD.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Frederick Grace, Chairman, Coytesville; John C. Abbott, Fort Lee; John S. Edsall, Leonia; Jno. H. Mannix, Assessor, Fort Lee.

RIDGEWOOD TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

C. A. King, Chairman, Ridgewood; Edward Keeley, Ridgewood; John G. Hopper, Assessor, Ridgewood; Dr. J. T. De Mund, Medical Member, Ridgewood. Wm. E. Maltbie, Health Inspector, Ridgewood.

One small public sewer for waste-water, otherwise private sewerage.

The streets and public grounds are under control of town committee.

No manufactories except new brick silk mill, just finished.

Two schools. One just finishing a driven well, in place of open well, which was declared foul.

No cemetery in township.

No prevalent diseases. Place unusually healthy.

(Signed) Wm. E. Maltbie,
Health Officer.

RUTHERFORD.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William A. Preston, President, Rutherford; Dr. H. H. Hollister, Rutherford; Dr. John J. Ketcham, Rutherford; Peter Dammers, Rutherford; Josephus C. Sares, Rutherford. Geo. P. Rice, Secretary and Health Inspector.

Driven wells, cisterns and natural springs furnish the water-supply.

Natural drainage; sloping ground both east and west, carrying surplus water toward the meadows and the Passaic river. The question of sewerage is under careful consideration by our present Board of Councilmen. House drainage is at present conducted into cesspools.

We have completed about two miles of Macadam this season, and the work will be continued next season. There are no public parks.

The houses are almost without exception, built with cellars, and but three buildings are used as tenement-houses. We have not as yet provided for a yearly inspection, but under the direction of the present Board, I am making a list of all the buildings within the borough, to include water-supply, drainage, number of families and other important matters, and we propose to keep this arrangement up hereafter.

Lighting is by oil lamps.

Cesspools are built with open bottom and brick and cement sides; lately, some have been built up close, and emptied at stated intervals, by a company at Jersey City who make a business of it.

No public markets; all stores are conducted for individual lines of goods.

About last May, June and July we had quite a few cases of diphtheria, caused by stagnant water collected by the excessive fall of rain during the early spring; as the ground dried, the cases diminished; all the trouble seemed to be located in particular districts.

Our present school, No. 40, being too small, we are building a new one, separate from the original building, and to be used exclusively for the primary classes. One of our sanitary officers being the District Clerk, keeps a fatherly eye to these matters, so that we have had unusually good health in these quarters.

The Police Department is conducted by the local authorities; we have a lock-up, only being an eighteen-foot square wooden building, suitable only as a menace to evil-doers, and used very little; it is generally termed a sweat-box.

Hillside Cemetery is the only burial-place.

I wrote you some time ago, expecting to enclose with this report a pamphlet with printed regulations, and fines for neglecting them; as the printer has not yet completed his work, am unable to forward at present. The rules laid down are simple and quite complete, and we trust by vigilance to have them enforced in the future.

In conclusion will state that at present we have about the first Board of Health that has made an attempt to make it a Board in fact, and not fancy. A great many nuisances have been caused to be abated, and as case after case has been pushed we find that the feeling seems to be that the orders of the Board will have to be complied with, and not near the trouble is experienced now in having offending parties promptly abate nuisances when ordered. We have no distinct disease here, peculiar to the locality. Generally speaking, Rutherford is an exceedingly healthy place. Reports of vital statistics are generally promptly made.

(Signed) GEO. P. RICE,
Secretary.

SADDLE RIVER.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Gilbert B. Ackerman, Chairman, Rochelle Park; Isaac A. Hopper, Secretary, Fair Lawn; Richard T. Snyder, Paterson; Wm. H. Doremus, Dundee Lake.

We have very little to report from this township this year. We have had no complaints made. The health of the people has been very good; no epidemics of any kind. As to animals, from the inquiries I have made there have been very few losses this year, and no prevalent disease amongst them.

(Signed) ISAAC A. HOPPER,
Secretary.

UNION TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

James Van Roden, President, Rutherford; A. L. Watson, Secretary, Rutherford; Dr. J. W. Phelps, Rutherford; John Kehoe, Lyndhurst; Edward T. Gallaway, Kingsland.

Refuse is removed by New Jersey Sanitary Co., of Passaic, N. J. One new school-house at Kingsland, cost about $8,000.

WASHINGTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Alonzo House, Chairman; John C. Blauvelt, Abram S. Van Horn; John H. Wortendyke, Assessor.

BURLINGTON COUNTY.

BASS RIVER TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jno. W. Harris, New Gretna; D. M. French, New Gretna; Chas. H. Cramer, New Gretna; C. Garrabrant, M.D., New Gretna; E. Russell Cramer, Assessor.

We have not formally organized a Board of Health, as the township is healthy and we have no nuisances detrimental to health.

(Signed) E. RUSSELL CRAMER,
Assessor.

BEVERLY TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George Conover, President, Bridgeboro; Chas. K. Van Sciver, Secretary, Beverly; Jacob Perkins, Beverly; Chas. Russ, Beverly. H. H. Matson, Health Inspector, Beverly.

Water-works, owned by company, have been erected in Beverly city and the pipes extended into the township. Some few houses take it. The Delaware river is the source of supply.

The health laws are generally appreciated and regarded, and it is not difficult to observe the improvement in the sanitary condition of this vicinity within the last few years.

The registration of vital statistics is not perfect. The physicians are inclined to send them to the wrong person. With us, I think the City Clerk receives many from the township, instead of the Township Assessor.

There has not been any epidemic this year, and the general health is good.

BORDENTOWN.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR

H. H. Longstreet, M.D., President, Bordentown; D. F. Waker, Secretary, Bordentown; Lewis Jemison, M.D., Bordentown; I. D. Young, M.D., Bordentown; Wm. H. Shipps, M.D., Bordentown; J. D. Flynn, Bordentown; Prof. William MacFarland, Bordentown. H. N. Jobes, Bordentown, Health Inspector.

The sanitary condition of Bordentown at the present time is more satisfactory than at any previous period during the past ten years. There is a growing disposition on the part of a majority of our citizens to recognize the value of preventive means as an important factor in the maintenance of health; hence, our Board of Health experiences little difficulty in securing their hearty co-operation in whatever concerns the health of the community. During the year a thorough inspection of the sanitary condition of all dwellings and premises within the city limits was made by the Health Inspector and assistants. This work necessarily involved considerable labor and expense, but the results demonstrated the value and necessity of the undertaking. According to the report of the Health Inspector, 399 families derive their water-supply from hydrants and seven from cisterns, while twenty-six families are reported without any water-supply of their own, depending solely upon the courtesy of kind neighbors to satisfy their needs; the balance, numbering 493 families and representing more than one-half of our entire population, depend upon sunken wells. In the great majority of instances the water thus obtained was found to be in good condition and free from organic pollution. In not a few instances, however, the wells or their surroundings were in a most deplorable state. In some cases water was taken from wells that had not been cleaned for many years, or whose close proximity to neglected cesspools or other sources of foulness rendered contamination of the water almost inevitable. The question of soil percolation as a means of water contamination is one too little known or appreciated, and a subject about which too much can neither be said nor written. In small towns and villages, water for domestic purposes is largely derived from wells, and so long as certain precautions are taken to prevent pollution of the water, this may be regarded as a satisfactory and, for the most part, safe method of supply. But as population increases, as the villages and towns become more closely built up and merge into cities, then the well, unless there be strong arguments to the contrary, must give way to other and safer mediums of supply. While, with us, there may not as yet exist any special danger in this direction, still the occurrence during the past month of several well-defined cases of typhoid fever in families who depend exclusively upon wells for their supply of water, and the absence of the disease amongst those who abstained from its use, leads to the belief that hereafter a greater degree of caution will be necessary in order to avert further evil of a like nature. Certain it is, the future will undoubtedly condemn what is now sanctioned or, at least, permitted to exist undisturbed. Whatever the source of water-supply, whether by wells or by means of other more modern methods, the question of purity, involving as it does the health of whole communities, is one that should at all times call for the exercise of the closest scrutiny and utmost watchfulness at the hands of those to whom the care of the public health is entrusted. Another fact developed by the late inspection relates to vaccination. The records showed that 414 persons, or about eight per cent. of the entire population, were unvaccinated, or more properly speaking, unprotected against the approach of small-pox, should they in any way be exposed to the contagion. With all the knowledge now possessed of the protective power of vaccination, any neglect to avail ourselves of this agent is little short of criminal. In order that no one could plead poverty as an excuse, the Board of Health at once advertised to furnish free vaccination to all who from want of means were unable to obtain it. A number availed themselves of the privilege. Never before in the history of Bordentown has there been so thorough and systematic an effort towards improving the sanitary condition of the city as was made during the past year. The good work commenced will be continued until the hygienic surroundings of our city rank second to none in point of completeness.

(Signed) WILLIAM H. SHIPPS, M.D.,
Reporter.

BORDENTOWN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Robert H. Allen, President, Bordentown; Isaac Elliott, Jr., Secretary, Bordentwn; Theodore Carter, Fieldsborough; Langhorn Thorn, Bordentown; Dr. W. H. Shipps, Bordentown; James Powell, Bordentown. Horatio N. Jobes, Health Inspector, Bordentown.

We have nothing to report this year, as the city nearly covers the whole township and gives us nothing to do.

BURLINGTON CITY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William H. Kimball, Burlington City; Shippen Wallace, Burlington City; Edward S. Lansing, Burlington City; Robert W. Waln, Burlington City; J. Hutchinson Lukens, Burlington City. Charles Stowell, Health Inspector, Burlington City.

The source of water-supply is from the river Delaware. Public supply. Board of Water Commissioners. Controlled by Common Council. Nearly all houses have it introduced. Not discolored. No iron in it. Soft. Not bad at any season of the year. Reservoirs are cleaned. No sewer outlet above intake. Very few depend on wells; none on cisterns.

The system of drainage for the ground is separate and apart from sewers. Cellars dry, except during heavy rain-storms, when surface-water flows in. No sewers of any amount; one only, on York street, and that only some three blocks in length.

Houses generally have cellars. But few houses are occupied by more than one family.

Sewers not used to any extent. Only very few houses connect with them. Cesspools built of brick, cemented. Emptied by night-soil men after October 1st. Contents taken out to suburbs and composted with coal ashes.

Malarial diseases most prevalent in September. No contagious diseases among animals. No register kept of persons keeping cows, hogs, &c.

Slaughter-houses not a nuisance.

No evil to health from manufactories.

(Signed) I. RUSSELL BATTEN.

CHESTER TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jos. T. Sullivan, Moorestown; Wm. Hutton, Moorestown; Morris Comfort, Moorestown; J. C. Stroud, M.D., Moorestown; S. S. Dager, Assessor, Moorestown.

CHESTERFIELD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John F. Rogers, Crosswicks; Simeon Hannold, Crosswicks; Thomas W. Ridgway, Chesterfield; Charles B. Holloway, Chesterfield.

We have nothing of special interest to report. There have been a few cases of chills, but none at present. The general health of the township has been good. There has been no complaint made to the Board.

(Signed) CHARLES B. HOLLOWAY,
Assessor.

CINNAMINSON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Wm. R. Lippincott, President, Cinnaminson; J. D. Janney, M.D., Township Physician and Secretary, Cinnaminson; Edward H. Ogden, Riverton; Isaac Evaul, Palmyra; Timothy Morton, Assessor, Parry.

The water-supply is by wells and cisterns. We know of but one family depending on cistern-water for drinking purposes. The well-water of the township is generally good, but hard.

There is no drainage except by surface and tile. Cellars are dry. Land, rolling. There are two creeks—the Pensauken and the Pompeston—the first forming the west line of the township; the other running from south to north through the township, emptying into the Delaware river. These streams are subject to tide-water and skirted by swamp or low-lands, which generate malaria. We have had about the usual amount of malarial fevers this summer and autumn. We know of no fatal cases of such fevers this season.

The houses generally have cellars. We know of but little use being made of house-cellars for storing vegetables. Farmers generally use outside buildings for such purposes, with cellars under them, when they store vegetables. There are no tenant-houses of more than two families, and very few of more than one family, in this township. There is no yearly house-to-house inspection, but families are frequently cautioned, by posted circulars, to look well to cleanliness of all buildings, outbuildings, gutters, &c.

There are a few water-closets in villages, having cemented vats under them, which are emptied by casting the excrement away into the open country and depositing it into compost beds for fertilizing purposes on farms. Water-closets in this township are generally without means of catching excrement, except on the surface of the earth. The excrement is required to be carted to the open country often enough to keep such places free from offensiveness. It is frequently deodorized with earth, ashes or lime. We think there has been improvement in this particular by the inhabitants of our township within two years.

There has been no unusual prevalence of disease this year. The Assessor inquires each year as to losses of animals and as to contagious diseases.

Slaughter-houses are inspected and kept clean, so as not to offend people.

There are several grave-yards in this township, but none, except the one near the Palmyra M. E. Church, which is likely to prove detrimental to the inhabitants.

We think care is taken to have school-houses as well ventilated as circumstances will allow, and we know of no crowding of scholars to the production of ill health. Our public halls are commodious, light and airy.

The public health laws are reasonably well regarded.

We believe that vaccination is well looked after, and the spread of contagion prevented.

We incur very little expense in our sanitary labors.

Houses are generally heated by stoves in the rooms to be warmed. There are some cellar-heaters; a few heat by steam. Buildings are generally well ventilated.

(Signed) J. D. JANNEY, M.D.,
Secretary and Executive Officer.

DELRAN TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

E. P. Austin, Bridgeboro; John Folz, Riverside; John McCleary, Riverside; Chris. Heiss, Riverside; W. T. Caldwell, Bridgeboro. Alex. H. Small, M.D., Riverside, Health Inspector.

EVESHAM TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

David D. Griscom, Marlton; Richard H. Leeds, Marlton; John W. Stratton, Marlton; P. V. B. Stroud, M.D., Marlton; William L Brown, Marlton.

Families supplied with water by wells; generally good.

Considerable underdraining to fit land for agricultural purposes, yet some cellars have water in, in the spring of the year or unusually wet times. No swamps of any extent.

The Assessor has inquired and not heard of any contagious diseases amongst animals.

But one or two slaughter-houses in the township. No complaint as a nuisance.

(Signed) WILLIAM L. BROWN,
Assessor.

FLORENCE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Chas. A. Baker, M.D., Secretary; John Peacock, Robert Cotton, Chas. H. Lucas. John Kale, Assessor. C. A. Baker, M.D., Health Inspector.

We have good natural drainage towards the river.

There is a water-supply pumped from the river into tanks, from them to a few fire-plugs, which are inadequate in case of fire, being so few in number. However, these plugs are used to wash out the alleys, and are thereby of sanitary value..

The refuse is removed by carts, and carted through the town to an adjoining farm.

We have two slaughter-houses in the town, which are a nuisance. But most of the meat comes from Trenton already dressed.

We have one school-house, with about 300 children in attendance. There is an Episcopal burying-ground in the heart of the town, with wells from which drinking-water is drawn, all around it.

No typhoid fever here for years. Malarial troubles the most prevalent, the type being intermittent.

(Signed) CHARLES A. BAKER, M.D.

LITTLE EGG HARBOR TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

I. L. Cowperthwaite, President, Tuckerton; T. T. Price, M.D., Secretary, Tuckerton; Francis French, Tuckerton; Charles M. Berry, Tuckerton; W. Otis Jones, Assessor, Tuckerton.

Water-supply from wells; raised by pumps, chiefly.

No drainage, except surface drainage. Natural surface drainage good. No sewerage, except surface gutters in some of the streets in Tuckerton. Cedar swamps on the streams. No malaria.

Houses generally have cellars, which are generally dry; not many with two families. No inspection.

Kerosene lamps are used for lighting purposes.

Very little garbage thrown in streets or roads. But few cesspools. Excreta usually composted and used on land.

No epidemic among animals.

One slaughter-house. No inspection.

No manufactories that are nuisances. The fish-oil factories would be, but are located on an island in the bay away from population.

School-houses in healthy localities.

(Signed) T. T. Price, M.D.,
Clerk.

MANSFIELD TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John R. Naylor, Columbus; Benj. H. Atkinson, Columbus; Benj. T. Warren, Columbus; Dr. D. G. Van Mater, Columbus; Abner J. Page, Columbus.

There has been nothing special to report; no prevailing epidemics. We have been comparatively healthy this year. The Board has been called out but once.

MEDFORD TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

E. H. Kirkbride, Medford; Henry Garwood, Medford; J. Reeve, M D., Medford; Chas. H. Kirby, Medford.

No drainage, except surface. Water-level low, so that dry cellars are secured. Some malaria. No swamps near.

No basements. Cellars used generally for vegetables.

No sewers. Most cesspools are built with open bottom. Emptied by pumping into a hole near by, dug for the purpose.

Slaughter-houses are generally in good condition and are inspected.

Township has been unusually free from contagious diseases during the past year.

MOUNT LAUREL TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles Andrews, Fellowship; S. R. Sharp, Mount Laurel; F. K. Dudley, Moorestown; J. B. Joyce, Assessor.

NEW HANOVER TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

E. R. Kirby, Clerk, Wrightstown; Lorenzo D. Woodward, Cookstown; Thomas Platt, Wrightstown; William Poinsett, Jacobstown; Amos Shaw, M.D., Jacobstown. George C. Davis, Chairman and Health Inspector, Wrightstown.

I submit the annual report of New Hanover township for the year 1888. For the year, the health of the township has been generally good, there being no contagious diseases among the people. The inhabitants have in the past years been educated to the importance of looking after the sanitary condition of their dwellings and the importance of removing every slough-hole by draining of the refuse and excreta, thereby overcoming or removing the germs which breed disease. A year or two back, malaria and typhoid fever were very prevalent. But the rainfall of this year having been so much greater in quantity, has filled up the streams, and thus keeping them pure, prevented the water becoming stagnated. I have noticed the people living along the same have been more healthy than when it was very dry. In the country the cellars are used for the storage of vegetables, these being put in the cellar in fall of the year, then taken out in the spring. There is not one farmer in fifty who has a potato or vegetable cellar unattached under the house. We had pleuro-pneumonia in a herd of cattle belonging to George Higgins. The State Veterinary Surgeon inspected the herd and ordered them killed. There was no further spread of the disease. All other subjects relating to the sanitary condition of the township have been fully reported in the reports of former years.

(Signed) GEORGE C. DAVIS,
Assessor.

NORTHAMPTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

W. G. Parry, President, Mount Holly; Chas. Travis, Clerk, Mount Holly; J. Fred. Lanmaster, Mount Holly; Samuel B. Keeler, Mount Holly. Geo. Branson, Health Inspector.

The water-supply is from Rancocas creek. Private company. Water is discolored. No trace of iron. Is soft. Apt to be bad when very low water. Reservoirs are cleaned twice a year. Receives some sewage from Smithville. No examinations made as to pollution, &c., Township Board of Health having no legal authority. About one-third or more depend on wells. No cisterns.

A portion of the town is drained by eight-inch pipe sewers. No other system of drainage. Cellars are not all dry. Some swamp on one side of the town, but no malaria to remark this year.

Sewers just constructed according to a plan completed under the direction of Col. Waring, but a large number of cesspools are used.

Town has just voted incorporation.

No house-to-house inspection.

Houses mostly have cellars. Very few, if any, houses used by two families.

The sewer system is about three miles long.

Cesspools are not cemented. Emptied by buckets, if ever. Some never emptied, being down to the water line.

Sewers are not yet very generally used; not half of those on the line use them.

We had some scarlet fever during the spring.

(Signed) CHAS. E. TRAVIS,
Secretary

PEMBERTON.

NAMES AND POST OFFICE ADDRESS OF MEMBFRS AND HEALTH INSPECTOR.

Jos. L. Budd, Pemberton; A. H. Fort, Pemberton; J. N. Smith, Pemberton; W. K Budd, Assessor, Pemberton.

RANDOLPH TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Wm. A. Maxwell, Wading River; J. V. Cavileer, Lower Bank; John W. Adams, Green Bank; John E. Gary, M.D., Lower Bank; Lewis A. Adams, Assessor, Lower Bank.

Randolph township is in the southeastern part of Burlington county. Population about 400. Climate salubrious.

The ground is a level, sandy soil, intersected by swampy and marshy tracts along the streams.

Water-supply from wells.

Natural sewerage and drainage.

Buildings are frame dwellings, occupied by watermen and farmers.

Refuse and excreta are disposed of as suits convenience.

Three schools and two churches. The buildings are situated on hills, so as to secure drainage, and in healthy localities.

SHAMONG TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George H. Wisham, Tabernacle; Samuel L. Daughty, Indian Mills; Ira Crain, Indian Mills.

SMITHVILLE.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Isaac Uncles, Chairman, Smithville; B. W. Storey, Smithville; Geo. W. Frazier, Smithville; R. R. Barrington, M.D., Mount Holly. Geo. W. Craig, Clerk and Health Inspector.

The water supplied to a part of the inhabitants of Smithville is from the creek that runs through the same, which is pure and of good quality. It is supplied by the H. B. Smith Machine Co. About fifteen houses take it. The water is discolored at times, especially during heavy rains, but generally becomes clear in from six to twelve hours, and is quite soft; have not known it to be bad at any one season of the year. Pipes are closely looked after, and there is no sewage or other foul matter above the point of supply. The rest of the inhabitants of the village, numbering about fifty houses, are supplied from wells, which yield most excellent water.

There is no system of drainage needed. In part of the village the water-level is such that the cellars are always dry. The other part is drained with tile, laid under the cemented bottoms of the cellars.

All houses have cellars, and there is no house with two families.

Cesspools in part of the place are built with open bottoms and backs; the other portion are cemented sides and bottom, and are emptied and hauled away with teams.

There is but one slaughter-house, and that is strictly inspected from time to time.

(Signed) GEO. W. CRAIG.

SOUTHAMPTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John W. Haines, Vincentown; Francis C. Naylor, Vincentown; Saml. Dixon, Vincentown; Dr. J. C. Brown, Vincentown; Charles C. Naylor, Assessor.

Water-supply by wells. Mostly soft, but not all.

We have no drainage system. Very few houses are troubled with water in cellars. No swamps near us. As we have some low meadows, chills and fever are sometimes prevalent.

Cesspools generally open and contents carted out on the land.

The prevalent disease in our township has been diphtheria. About four to five miles above here, in the woods, it has been very bad, and fatal in most every case.

SPRINGFIELD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

David Stockton, Jobstown; Charles Deviney, Juliustown; Isaiah King, Jacksonville.

Population 800.

Well-water is used; good.

Drainage good.

Cellar to houses. Single families.

No diseases.

Two slaughter-houses; no complaint.

Schools, six—public.
One policeman and lock-up.
Four cemeteries.
Stoves used for heating.
Township healthy.

WASHINGTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Gustave Voss, Green Bank; Geo. Wright, Batsto; Tower Sooy, Green Bank; A. E. Koster, Assessor, Green Bank.

Washington township, Burlington county, is very thinly settled.
The water-supply is good—from wells.
Township very healthy.
Only one family in a house.
No prevalent diseases.

(Signed) A. E. KOSTER,
Assessor.

WESTHAMPTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Uriah Borton, Burlington; William Deacon, Mount Holly; Chas. F. Hulme, Mount Holly; R. R. Lippincott, Assessor.

WILLINGBORO TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Oliver Parry, Beverly; A. J. Jorden, Burlington; Alex. Thomson, Rancocas; I. M. Stokes, Rancocas.

WOODLAND TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Nicholas P. Todd, Shamong; John A. Bosarth, Vincentown, Edward Layton, Pointsville.

CAMDEN COUNTY.

CAMDEN CITY.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Chas. Watson, President, 432 Federal street; Geo. F. Hammond, No. 20 South Third street; Herman W. Miller, Mount Vernon, corner of Eighth street; Wm. T. Mead, 601 West street; Thad. P. Varney, 264 Kaighn's avenue; John W. Druges, M.D., 1801 Broadway; George R. Fortiner, M.D., 542 Federal street. J. D. Leckner, M.D., 260 Kaighn's avenue, and Septimus Knight, 127 Kaighn's avenue, Health Inspectors.

Location on the Delaware river, opposite the city of Philadelphia. Population, estimated, 60,000 to 65,000. Climate generally healthy. Area of city about 3,550 acres.

Sandy, with in some locations a slight layer of gravelly loam; contour from two and a half to twenty feet above high-water.

Reservoir water-supply, taken from the Delaware river.

This city is drained by many sewers, their outlet being the Delaware river; two of the sewers in the southern part of the city have their outlet into the meadows (and are supposed by physicians to have caused a great amount of sickness in that locality). The city authorities, urged by the Board of Health, have commenced a series of ditches in these meadows, which will be the means of carrying all drainage from said sewers into the river.

Streets are generally paved. Those that are not, generally have paved gutters. They are cleaned by contract and are in a fair condition. We have some streets near the river that have no sewers in them and are very near level, causing stagnant water to stand in gutters, but the city authorities are putting in sewers, which will eventually overcome the difficulty.

Houses very near evenly divided between frame and brick, and generally occupied by one family.

Gas, naptha and electric lights.

Refuse and excreta are mostly taken to farms outside the city limits. Privy vaults cleaned by odorless apparatus.

Two general market-houses and many private ones. Good condition.

Several private slaughter-houses, which drain into public sewers.

Iron works, asphalt block manufactory, machinery, chemicals, woolen goods, dye stuffs, nickel works, fertilizers, woolen goods, cord and tassel, fruit canning, tallow and soap works, ink, lithographic works, &c.

Public schools and several private ones, well drained, heated and ventilated; city hall, county court-house and jail.

Cooper Hospital, Homœopathic Hospital, Camden City Dispensary and Camden Home for Friendless Children and Colored Orphanage, also a charitable organization for the relief of the poor.

One Chief of Police and forty-two patrolmen, city jail and Camden county jail.

All schools and public buildings have fire-escapes. All buildings of three or more stories in height, where thirty or more persons are employed or congregate, are required to have fire-escapes.

Four cemeteries. The State law in regard to burials is strictly enforced.

We have two codes, one in relation to nuisances, &c., and one governing the plumbing and drainage. The latter went into effect October 26th.

Registration of births, deaths, &c., is required as per State law.

In all cases of contagious diseases thorough disinfection of the room and of all discharges from the patient is required, and after recovery or death the house is fumigated. No public funeral is allowed.

Two thousand dollars were appropriated for the expenses of the Board.

Nearly all public buildings are heated by steam, except the schoolhouses, which have furnaces. The greater number of private residences by stoves.

Typhoid fever has been the most prevalent disease of the year, with a sprinkling of scarlet fever and diphtheria. In the main, the last year has been free from any marked epidemic.

(Signed) SEPTIMUS KNIGHT,
Health Inspector.

CENTRE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Ezra C. Bell, Mount Ephraim; John Hutchinson, Mount Ephraim; David H. Shreeve, Mount Ephraim; Charles C. Clark, Mount Ephraim. Franklin E. Williams, Town Physician and Health Inspector, Haddonfield.

DELAWARE TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

J. A. Meredith, Haddonfield; Wm. Graff, Ellisburg; Samuel T. Coles, Ellisburg; Wm. D. Coles, Ellisburg. W. S. Long, Health Inspector, Haddonfield.

The Board of Health for Delaware township report the occurrence of an epidemic of scarlatina in the neighborhood of Ellisburg, in the Seventh School District, in the month of December, 1887. The school was closed two weeks, during which time twelve children were affected. It was of a mild type, and was not followed by any evil consequence. With this exception we have been free from all diseases, either in man or lower animals, calling for our attention.

(Signed) W. S. Long,
Health Inspector.

GLOUCESTER CITY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jas. A. Wamsley, M D., President, Gloucester City; Duncan H. Blake, M.D., Gloucester City; Wm. J. Thompson, Gloucester City; Thos. K. Costello, Gloucester City; J. Edgar Parker, Gloucester City. Patrick Mealey, Health Inspector.

Located on east side of Delaware river. Newtown creek is on the north and runs almost around the city. Little Timber creek is on the south side. The population of the city is between 7,000 and 8,000. The climate is not considered very healthy, as there are quite a number of inhabitants who have malaria.

The water-supply of city is principally from springs through reservoir located near Newtown creek. When said supply is not sufficient (which is not often), they open gate and get water from Newtown creek. Both creeks are filled, at high water, with reeds, except in the center of stream. The water, when high, flows all over the meadows, which are filled with reeds.

There are but two sewers in this city.

Streets. Some of them are in bad condition; generally stagnant water settles where there is no drainage.

Gas is used for street lamps in city, and gasoline in outskirts. Electric lights are used in some parts of city.

There has been a Board of Health organized separate from City Council, and they have passed a Sanitary Code and propose to enforce it.

Sanitary expenses. The Common Council appropriated $600; the Board wants it increased to $1,000.

(Signed) DANL. F. LANE,
Secretary of Board of Health of Gloucester City.

GLOUCESTER TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George Brewer, Blackwood; Charles Stevenson, Blackwood; Jos. E. Hurff, M.D, Blackwood; Seth C. Bishop, Kirkwood; Jos. S. Stewart, Chew's Landing.

HADDON TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John Stoy, Chairman, Haddonfield; W. C. Nicholson, Secretary, Haddonfield; Samuel Wood, Haddonfield; J. Stokes Coles, Haddonfield. F. E. Williams, M.D, Health Inspector, Haddonfield.

The water-supply is from wells and a private water company. The water company has been in operation about a year. A great many have taken the water, and more are making connections. The basin or pond is about a mile out of the town, and is pure spring-water. All overflow from rains is conducted around the pond. The pipes are cleaned by opening the fire-plugs. The number using wells and cisterns, I cannot answer.

There is no drainage, except the natural slope of the land. Cellars are mostly dry.

Houses have cellars, and most of the cellars have heaters in them. Cannot tell how many tenement-houses have more than two families, but do not think there are any. There is no yearly house-to-house inspection.

There are no sewers. Some cesspools are cemented and some are not.

There are no markets.

There has been no prevalent disease this year.

The slaughter-house is kept in good sanitary condition.

There are no manufactories.

The school-houses are well ventilated and are kept in good sanitary condition.

There is no alms-house or hospital.

There are three cemeteries or burial-grounds.

The laws regarding the public health are well looked after.

The registration of vital statistics the Assessor has charge of.

There has been no need of any quarantine, as there has been no contagious disease.

We have no sanitary expenses.

The houses are mostly heated by furnaces; some few have steam and are generally well ventilated.

The only prevalent disease was whooping-cough, which was very bad through the spring and summer. There were several deaths from it.

(Signed) W. C. NICHOLSON,
Secretary.

STOCKTON TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Geo. Molineaux, Assessor, Cramer's Hill; Benj. Abbott, Cramer's Hill; Frank Horner, Merchantville; Chas. K. Seddenger, Cramer's Hill; Jerome Artz, M D., Cramer's Hill. Benj. Abbott, Health Inspector.

Stockton township is located between Cooper's creek and Pensauken creek, the Delaware river on the north and Haddon avenue on the south. The population is between five and six thousand. Climate about the same as Camden city.

The soil is principally sandy, with the exception of the clay-pits near Fish House.

Water is supplied principally from wells, and some few from the water-main leading to Camden.

Drainage very poor; nothing but natural drainage.

The refuse, &c., is used in composting, and not allowed to accumulate.

The Board has been thoroughly organized.

We have had three cases of small-pox in one family. They were quarantined, the residence thoroughly fumigated, and every precaution taken to prevent the spread of the disease. The entire population were vaccinated four or five years ago. No spread.

The expenses this year were of course increased on account of the few cases of small-pox, &c.

We have had a very severe epidemic of acute dysentery, and a large number of malarial fever cases, but considering the increased number of inhabitants the health of the township has been remarkably good.

(Signed) G. W. MOLINEAUX,
Assessor.

WINSLOW TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Josiah Alberton, Clerk, Waterford; H. M. Jewett, Winslow; E. A. Russell, Sicklerville; Zober Venton, Elm; M. G. Burdsall, Assessor, Wilton.

CAPE MAY COUNTY.

CAPE MAY CITY.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

E. H Phillips, M.D., President; W. F. Cassedy, Secretary; Geo. Foster, Jos. Hand, Wm. Essen, Sr. Martin C. Swain, Health Inspector.

Our water-supply is obtained from surface wells about one mile inland and north from our city. It is generally used in our city and is owned by the city corporation. It is always clean, pure and soft. Has no taste. Very few families use well-water, and but two or three have cisterns.

Our sewerage and drainage are combined. We have adopted no particular system. Most of city has dry cellars. We have salt meadows, but very seldom have malarial troubles.

Sewers are from eight inches to one foot in diameter. Cannot state the fall, but it is slight, and are emptied into tide-water inlets from the ocean.

We have no basements. Very many houses have cellars. There has been no house-to-house inspection. Most of our houses are connected with sewers.

Cesspools are not cemented. Are emptied by carting the contents away in carts. Contents are used as fertilizer.

There has been no prevailing disease.

Hogs are not allowed to be kept within the limits of the corporation from May until October.

Slaughter-houses are not allowed within the corporation.

We have no manufactories.

(Signed) E. H. PHILLIPS, M.D.,
President Board of Health.

DENNIS TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John F. Goff, East Creek; E. W. James, Dennisville; Remington Corson, South Seaville; Morris Warwick, Dennisville; G. G. Carll, Township Physician, South Dennis.

During the month of August, complaint was made to the Board of Health, of a nuisance caused by the dumping of garbage and manure on the farms on the sea-shore, from Sea Isle City; the Board immediately gave notice for its abatement, and no further complaints have been made, the authorities of Sea Isle City having provided other means of relieving their city without placing it in this township.

There have been no contagious diseases or epidemics reported during the year. Malaria is very seldom known in our township. There are no stagnant ponds, there being a natural drainage toward the ocean and Delaware bay.

(Signed) MORRIS WARWICK.

HOLLY BEACH CITY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Edward Lunis, President, Holly Beach; Martin L. Harrison, Secretary, Holly Beach; Edward Potts, Holly Beach; Theodore C. Brown, Holly Beach; William A. Lake, Holly Beach.

Holly Beach City is situated on what is known as the Five-Mile Beach, on the southeastern coast of New Jersey. The city itself is in the center of the beach, and has an acreage of 400, with a permanent population of 450 inhabitants. Climate, mild.

The city is situated on a low, sandy stretch; one-half low and sandy, interspersed with sand-hills, the other half composed of marsh or meadow lands.

The water-supply is chiefly from cisterns and wells. Since the organization of this Board all wells have been closed, and cisterns, tanks and barrels used for drinking and culinary purposes, though there are five wells in use for cattle and washing.

The drainage is unsatisfactory, depending alone on surface drainage, with only one street with a trunk in. Water lies too near the surface for any cellar. Considerable swampy ground within the city, and mild cases of malaria prevalent in the autumn, though becoming less as fast as the low places are filled.

Too low for basements or cellars. House inspection yearly.

Have no cemented cesspools; all are provided with water-tight receptacles, which are emptied two or three times weekly, and contents composted outside the built-up portions of the borough, on the meadows. No sewers.

Have no slaughter-houses; contrary to our health laws. There is also a borough ordinance prohibiting the erection of any manufacturing establishment.

Have one school-house, capable of containing 100 scholars, the upper story of which is used as a public hall.

No alms-houses or hospitals; depend on the Overseer of the Poor to relieve such cases as come within his jurisdiction.

The police body composed of a Marshal. Have a lock-up containing two cells.

No fire-guards or escapes within the borough.

No cemeteries; all bodies interred on the mainland.

Have a code of ordinances adopted, and endeavor to have them enforced for the protection of the public health and improvement of the sanitary condition of the borough.

Keep no record of registration and vital statistics in this office.

Since the formation of this borough, have not had any contagious diseases within the limits, nor have we taken any quarantine measures. Have only had one case of an infectious nature, diphtheria, which we kept isolated and prevented attendance at school until notified by physician of a thorough recovery.

Sanitary expenses $350 per year.

Heat for dwellings furnished by the ordinary coal and wood-stoves, and ventilation of dwellings, taken as a whole, satisfactory.

We have had no diseases at any time, with the exception of a few cases of chills and fever, and mostly occurring in the autumn, and one case of diphtheria of a mild type.

Will simply state that this being a new settlement, and having considerable drawbacks to contend against, our progress as a Health Board has not been as satisfactory as we would wish. Our main difficulty is in having so many places, as low lots, to fill, and lying too near the surface of the water for any kind of sewerage. But by our weekly removal of all excreta, and by our filling up of all low places, we keep the locality healthy.

LOWER TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Stephen Weeks, Chairman, Cold Spring; Wm. C. Rutherford, Secretary, Cold Spring; Wm. C. Town, Cold Spring; Wm. L. Cummings, Fishing Creek.

We are glad to say that we have been very much favored with good health and have had no contagious diseases during the year. We think it has been an unusual year for good health generally. The Board has not been called out to abate any nuisances, and our inhabitants seem to take more interest in keeping all things pertaining to the welfare of health in a fair condition.

(Signed) WM. C. RUTHERFORD,
Secretary.

MIDDLE TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Samuel E. Douglas, Cape May Court House; Townsend W. Garretson, Cape May Court House; Isaac M. Downs, M D, Cape May Court House; Thomas P. Erricson, Green Creek; Stillwell H. Townsend, Burleigh.

Water is obtained from open dug wells, driven wells and in a few cases from cisterns. The water in many of the dug wells is totally unfit for use. In all cases of driven wells the water tastes of iron.

Many cellars have water in them in the winter season. There are many swamps, but no cases of malaria have been reported.

About one-tenth of the houses have cellars, and they are largely used for the storage of vegetables. About eight houses have two families living in them. There is no yearly house-to-house inspection.

Cesspools generally have open bottoms; some are cemented and some are made of wood; the contents are generally used for manure.

A code of laws was passed by the Board last spring. But one case has been reported and the person immediately put a stop to the nuisance. The general health of the people of this township for the past year has been good. Late in the fall and early part of last winter a large number of horses died, but the disease has entirely ceased. No persons were reported for failing to comply with the law passed by the Board, which requires them to be buried three feet under the ground.

(Signed) STILLWELL H. TOWNSEND,
Secretary.

OCEAN CITY.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

J. Conver, Ocean City; B. Newkirk, Ocean City; H. C. Sutton, Ocean City; J. Steelman, Ocean City; J. S. Waggoner, M.D., Ocean City.

The health of Ocean City for the year ending, is the same as for the past two years—remarkably good; no malarial or prevailing diseases of any character.

Water-supply and drainage good. If we could induce council to join us in having water-closets cleaned by contract, our only trouble at present, would be overcome. We have an ordinance to prevent all cleaning during the summer months, but it requires considerable attention on our part, that they are attended to early in the season.

(Signed) J. S. WAGGONER, M.D.,
President of Board.

UPPER TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

James G. Stille, Tuckahoe; Washington Van Gilder, Petersburg; Sylvanus Corson, Seaville; Washington V. Young, Salem. Randolph Marshall, M.D., Health Inspector.

The general health of the township for the past year has been remarkably good. No epidemics have visited us during the last year.

We have had but few deaths, and those mostly of elderly persons, from causes not dependent on want of proper sanitary regulations.

(Signed) RANDOLPH MARSHALL, M.D.

CUMBERLAND COUNTY.

BRIDGETON.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Chas. E. Sheppard, President; C. B. Moore, Secretary; Chas. E. Mulford, Eli Loper. M. W. Applegate, Health Inspector.

COMMERCIAL TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Seth Bowen, Mauricetown; Henry Mayhew, Mauricetown; Samuel Shinn, Port Norris; Samuel Butcher, M.D, Mauricetown; Daniel T. Howell, Assessor, Mauricetown; George E. Butcher, Town Clerk, Mauricetown.

During the past year the health of the township has been good, except mild malarial fever, which has prevailed and has been easily controlled.

The sanitary condition of the township is carefully looked after.

The water-supply is obtained from wells, from ten to thirty feet deep, which afford an abundant supply of pure and wholesome water.

The meadow and swamp land continues to be overflowed by tide-water, affording an over-supply of dampness in the air, but does not appear to produce any derangement of the general health.

The flatness of the country requires surface drainage.

The slaughter-houses are kept in excellent condition, and no offensive effluvia are allowed to exist.

There has been no prevailing disease amongst animals.

School facilities are kept up to an ordinary standard.

DEERFIELD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Elijah P. Parvin, Assessor, Deerfield; Dr. Charles C. Phillips, Deerfield; Phineas Hires, Deerfield; Joseph Golder, Deerfield; Edward S. Woodruff, Woodruff's Station.

The high position of the township, with its good drainage, and the agricultural pursuits of its inhabitants, prevent many diseases from having a foothold within its borders. Malaria is unknown, no endemics, and when epidemics occasionally make an appearance, they are generally mild in character, readily yielding to treatment. During the past year there has been little sickness, and that of a mild character, with very few deaths, except with aged people, who have been taken away by cardiac and cerebral diseases. No unusual sickness among children, with no visitation whatever of any eruptive epidemic, or of any other character, during the year.

(Signed) DR. CHARLES C. PHILLIPS.

DOWNE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Leonard H. Chance, Clerk; George Chance, Assessor; Andrew P. Glanden, M.D., E. D. Fleetwood, Jos. C. Bradford.

The township is low, with poor surface drainage.
Water-supply good.
Refuse or excreta is carried out and turned under for fertilizer.
Slaughter-houses are generally well kept.
Health is looked after by the Board of Health.
Registration is carried out according to law.
Some intermittent fever the past year.

(Signed) LEONARD H. CHANCE.

FAIRFIELD TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Mark S. Westcott, Geo. S. Whitecar, E. O. Davis; Harris Ogden, Assessor, Fairton. J. C. Applegate, M.D., Health Inspector.

The location of our town is such that we have good natural drainage into the Cohansey river.

Out-houses are generally disinfected and excreta utilized as fertilizer beyond the town limits.

Public grounds and highways are kept in good condition.

Schools are graded and ventilation good.

The laws regarding vaccination are generally observed.

Perhaps one of the largest beef and pork packing establishments in South Jersey is located about one-fourth of a mile from the town, but the slaughter-house in connection therewith is kept in good condition, and as yet we have been unable to trace any disease as originating from it.

During the past year a glass manufactory has been established here, giving employment to about fifty persons, but is located so as not to impair the health of the community in the least.

Our atmosphere is very dense and heavy, composed of salt and fresh air; hence we have various throat affections, otherwise the sickness during the year has been general. We have had 'no epidemics with man or beast.

Three-fourths of the deaths we have had have been from long-standing kidney affections, due, in my opinion, to the continued use of remedies of which they knew nothing, save the good things the advertiser has said. It may have been years ago that this destructive work of these organs was commenced, but, encouraged by the stimulating ingredient therein, they have gone too far, and, finally, appeal to us, giving us employment night and day, but not desirable by any means, because the atrophic work has already commenced. We have had some isolated typhoid fever, but generally of a mild type, the fever having been mostly of malarial origin.

(Signed) J. C. Applegate, M.D.,
Inspector.

GREENWICH TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Samuel R. Mills, Chairman, Greenwich; Samuel P. Fithian, Secretary, Greenwich; William P. Test, Greenwich; Samuel M. Watson, Greenwich.

The Board met in the early spring and organized, but as there was nothing brought before them or came under their observation to be acted upon, therefore there has been no business for the Board to do. We have had no epidemics this year, neither among the people nor animals.

HOPEWELL TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

M. M. Johnson, Seeley; James F. Glaspey, Bridgeton; Cornelius Sharp, Bridgeton.

LANDIS TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Theo. Foote, M.D., Chairman, Vineland: Geo. Davidson, Secretary, Vineland; J. D. Eilenberg, Vineland; Jas. Chance, Vineland; W. W. Whiting, Vineland.

We have nothing new to report. Our township is very healthful, and the Board is determined, if possible, to keep it so. We have not had a Health Inspector this year.

(Signed) GEO. DAVIDSON,
Secretary.

LAWRENCE TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Robert Howell, Cedarville; Ephraim Bateman, M D., Cedarville; Henry S. Garrison, Cedarville; E. T. Blackwell, M.D., Cedarville.

Conditions favoring good health have obtained in this district. No local cause of ill health has been brought to the attention of the Local Board, and no disease has become epidemic.

The drainage of the streets and drive-ways has been exceptionally good.

Refuse and excreta have been so managed as not to attract public attention.

Few animals are slaughtered within the precinct, the butchers' meat placed on sale being mostly derived from without.

The canning of tomatoes, which is carried on extensively, is managed without discomfort or detriment to the community.

Of houses and their tenancy there is no cause of complaint.

There has been no disease among animals.

There have been few burials in the district, such interments being discouraged by the Board. The depth of graves, according to observation and reports, is deemed satisfactory.

School buildings are in good sanitary condition, and intelligent attention is given to warming and ventilation. No call has been made by the school authorities for the vaccination of any pupil, and vaccination is generally neglected.

The registration of vital statistics has been properly attended to. No expense has been incurred by the Board.

(Signed) ENOS T. BLACKWELL, M.D.

MILLVILLE.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John N. Branin, T. C. Wheaton, Samuel Miskelley, Edwin Conover, L. H. Hogate, Richard Radcliffe. John Hartman, Health Inspector.

Millville is a flourishing city of nearly 10,000 inhabitants, lighted by electricity and furnished with good water by the Millville Water Company. The majority of citizens, however, have their water-supply drawn from wells on the premises.

The city has no system of drainage other than surface drainage, and this fact causes much annoyance and inconvenienee to the City Council. About $5,000 are annually expended on roads and streets, attention being given to grades, to carry off refuse and foul water.

There are no sewers here, each house having a cesspool, a small number of which are cemented. The cleaning of these is governed by ordinance of City Council and Board of Health.

No prevalent diseases but diphtheria have molested us this year.

There are several slaughter-houses in the city, but they are carefully conducted.

Taking all things into account, Millville has no cause for complaint in the health line.

(Signed) L. H. HOGATE.

STOE CREEK TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles B. Bowers, Chairman, Shiloh; Edward N. Sheppard, Roadstown; David Ogden, Greenwich; Dr. Joseph Tomlinson, Physician, Roadstown; Ephraim Mulford, Assessor, Roadstown.

On looking over the schedule of subjects, I find nothing of interest but what has already been reported. Our physician knew of nothing in his practice that he deemed essential to mention.

As a rule, the physicians are prompt in making their returns.

ESSEX COUNTY.

BELLEVILLE TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Daniel M. Skinner, Medical Member, President, Belleville; John H. Eastwood, Belleville; Charles H. K. Smith, Belleville; Charles Couse, Belleville; Richard P. Scaine, Belleville; George T. Casebolt, Belleville; William Connolly, Assessor, Belleville.

There is nothing of importance to add to former reports. A thorough inspection has been made of the town and many nuisances abated.

(Signed) D. M. SKINNER, M.D.

BLOOMFIELD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Thomas Oakes, President, Bloomfield; Reuben W. Dodd, Bloomfield; Geo. W. Cook, Bloomfield; Walter S. Freeman, Bloomfield; Stan. Farrand, Bloomfield; J. Edward Stubbert, M.D., Bloomfield. Samuel F. Baxter, Secretary and Health Inspector, Bloomfield.

During the past year the health of Bloomfield township has been exceptionally good. There has been no epidemic, and of contagious diseases there have been only a few sporadic cases.

Under the new law adopted by the Health Board, nuisances are promptly abated as soon as reported, and the hygienic condition of the township is thus kept up to the highest point of excellence.

(Signed) J. EDWARD STUBBERT, M.D.

CALDWELL.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

E. E. Peck, M D., President, Caldwell George C. Burnett, Secretary, Caldwell; Stephen Van Orden, Caldwell; Geo. M. Canfield, Caldwell; James K. Bush, Caldwell; Frank C. Goble, Verona; Henry V. N. Jacobus, Cedar Grove.

Our township is the most northerly in the county, being bounded on the north and west by the Passaic river. That portion being extremely low, floods in seasons of heavy rainfalls, while the south and eastern are hilly and mountainous.

The people of the township are the occupants of small homesteads and are agricultural in their pursuits.

The water is procured from wells, mainly, though flowing springs abound, and the quality of the water is good.

The houses are generally small and serve for one family. There are no slaughter-houses or manufactories among us, giving offense. The school-houses are eligibly located and care to health and comfort is observed. The inhabitants of the township are observant of the laws of health, and there has been no undue sickness among us.

Dairy farming is one of the principal industries and many cows are kept, but I have yet to hear of any kind of disease affecting them. (Signed) GEO. C. BURNETT.

CLINTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jacob W. Fisher, President, Waverly Park; W. H. Goldsmith, Secretary, Lyons Farms; James H. Mortland, Irvington; John Medcraft, Irvington; Louis E. Voorhees, Irvington; Abram Voorhees, Irvington. M. Osborne Christian, M.D., Health Inspector, Irvington.

The township of Clinton is located to the west of and adjoining the city of Newark, with an arm extending east into the Newark meadows, and lying between Newark, on the north, and Elizabeth, on the south. A large portion of the township is incorporated as the village of Irvington and has a separate Local Board of Health. Population, including village, about 2,900. Village, about 1,800.

Tho topography of the township is rolling, with water-shed from east and west toward the Elizabeth river, an inconsiderable stream which flows from north to south centrally through the main part of the township. The eastern arm being mostly salt meadow and low land, has drainage through Bound creek, a tide-water stream emptying into Newark bay.

The water-supply is mainly from wells, usually extending several feet into the rock, and is generally of good quality.

There is no regular system of drainage adopted, but cellars are usually dry and in good condition. There is a swampy section in the northeastern part of the township, which was drained several years ago by a drainage commission.

Houses generally have cellars, not largely used for storage of vegetables. A few have occupied basements; these are mostly in the village. There are probably not more than a dozen houses in the township outside the village having a plural tenancy. There is no house-to-house inspection.

There is no regulation of cesspool construction outside the village.

There have been no outbreaks of contagious diseases among animals during the year.

School buildings are in good hygienic condition, with enforced vaccinations and absence of children from houses containing infectious diseases.

There are two cemeteries, or burial-places, in the township—Clinton cemetery, in the village and upon the banks of Elizabeth river, and Newark potter's field, down in the salt meadow section.

With the exception of a very few malignant cases of diphtheria last March, there have been no diseases prevalent, and the general health of the township for the year has been better than the average.

The principal source of annoyance has been the desire of a few farmers to have dead horses and night-soil deposited on their land, a matter in which a few are very persistent.

(Signed) M. OSBORNE CHRISTIAN, M.D.

EAST ORANGE TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

W. H. Wiley, Chairman, East Orange; T. R. Chambers, M.D., Secretary, East Orange; G. E. P. Howard, East Orange; A. H. Ryan, East Orange; F. A. Nott, East Orange; T. E. Vermilye, East Orange; David Wilson, East Orange; Richard Coyne, East Orange; J. F. Smith, East Orange; N. M. Culberson; East Orange; E. W. Cowdrey, Assessor, East Orange.

According to last census, the population was over 12,000.

The past summer has been unusually cool and the number of rainy days more than the average.

The immense dug wells which have now been in use over two years continue to give the highest satisfaction; the water is pure and the supply more than the demand for household and fire purposes.

A portion of the township is being drained, under commissioners, and there are several other parts of the township needing drainage. One area in the central and southern portion is under consideration at the present time, the growth of the neighborhood demanding that something shall be done without delay. The cesspool nuisance is abating, for when complaint is found the health officer recommends connecting with the sewer system. The sewer system, which was reported as under way last year, is practically completed. Considerable water leaks into it, but not sufficient to interfere with its working, which is thus far eminently successful. Four hundred connections have been made. Many skeptical parties fail to join the system, who really would be greatly benefited by it. They predict its failure, but the officers in charge and others versed in such matters are very sanguine.

Many new streets have been macadamized, lighted and have sewer and water-pipes, since last report.

The new houses are generally of $4,000 to $6,000 type, though many cheaper ones have been erected, and find tenants ready to occupy them.

The township provides a public scavenger, who removes the garbage from barrels placed on the sidewalk in front of houses. The material thus gathered is carted to the poor-farm and dumped. Cesspool matter, which is gathered by private individuals, is dumped into trenches properly dug in unoccupied land, and an abundance of lime and copperas is employed, all under the supervision of the Ordinance Committee of the Town Committee.

The schools have become so crowded that two buildings have been made very much larger, and still their growth again is only a matter of a few years. The subject of a Board of Education for the town, and the construction of a high school for the whole town, is under earnest consideration. This would relieve the present buildings of their crowded condition and divide the expense of a new building between the four wards. An industrial department is becoming a feature of all the schools, and some excellent work has already been done.

The police force has been increased and numbers thirteen patrol, two roundsmen, two Sergeants and the Chief—eighteen in all.

Precautions for fire are very nearly perfect, as far as they may be with a volunteer company. There are five hose companies and one hook and ladder. The latter is drawn by horses. Two substantial brick buildings and the Gamewell fire-alarm service give the town a well-equipped service. Besides, the companies are enthusiastic and have done good work, their services having been required, unfortunately, about twice a month, on an average.

There seems to be room for improvement in the management of the two R. C. cemeteries in our township. With the new code to be adopted when the Legislature shall grant the privileges desired, now refused to townships, we expect to hold the cemeteries to a strict accounting for unsanitary business.

The expenses of the Board for 1888 will be about $731.

(Signed) T. R. Chambers, M.D.,
Secretary.

FRANKLIN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

R. J. M. Chase, Franklin; James W. Sargent, Franklin; R. W. Booth, Franklin; Henry A. Connely, Franklin; William H. Banta, Franklin.

Located on branch of New York, Lake Erie and Western railroad, and is about two miles square.

Population about 2,000.

Streets in very fair shape.

Kerosene used for lighting.

The industries are the manufacture of hosiery and quarrying of stone.

The town is generally healthy, as the Board has had no occasion the past year to meet, and our one physician finds plenty of time to visit all the sick.

(Signed) R. W. BOOTH,
Secretary.

LIVINGSTON TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Nelson Smith, Chairman, Livingston; George E. De Camp, Secretary, Roseland; Archibald Parkhurst, Livingston; Alson Walker, Roseland; Bern W. Dickerson, Chatham; Frank Meeker, Livingston.

The health of the township has been good. No contagious diseases have visited us. There has been an increase of malarial fever over last year, caused by the overflow of the Passaic river; the low meadows being under water the most of the summer.

(Signed) GEORGE E. DE CAMP.

MILLBURN TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William M. Deen, Chairman, Short Hills; Wesley R. Ayres, Millburn; E. B. Renwick, Millburn; Benj. F. Lord, Millburn; Samuel B. Passills, Millburn; Wellington Campbell, Physician, Short Hills. Isaiah Williams, Secretary and Acting Health Inspector.

Population about 2,200.

Water-supply from wells and springs.

Drainage and sewerage mostly surface or cesspools.

Streets are not kept in utmost state of good repair, nor are public grounds.

Houses kept in fair repair.

Lighting is mostly by lamps.

Refuse mostly accumulates, and may be used as fertilizer or allowed to decay.

One or two good markets; several small dealers.

Have not heard of any diseases among annimals.

No slaughter-houses, to my knowledge; butchers may slaughter a few calves or hogs.

Two paper mills, one paste-board mill, two or three hat shops and several small hat shops.

Three public schools in township; some small private schools.

One town poor-house—four paupers; no hospital.

No police; two or three constables.

No fire-guards or escapes.

Two cemeteries.

No laws in regard to public health nor measures taken to abate nuisances, except upon complaint; must say there is very slight cause to complain.

Returns of vital statistics are made to Assessor, who forwards to State Board.

Has been no occasion for quarantine; has been no contagious disease of any moment; ordinary vaccination is attended to by physicians.

Heating mostly by stoves and furnaces; some few houses by steam.

There has not been any marked increase in any one form of disease; have been no epidemics; we are not apt to have them. During the past year we have enjoyed a very fair degree of healthfulness.

I am impressed by the fact that there have been but two complaints made, which were immediately acted upon, and the cause rectified.

(Signed) W.. CAMPBELL, JR., M.D.

NEWARK CITY.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Joseph E. Haynes, President, Newark; Alexander H. Johnson, Newark; Tyler Parmly, Newark; Henry R. Baker, Newark; Dr. F. B. Mandeville, Newark; Dr. Charles M. Zeh, Newark; Dr. Herman H. C. Herold, Newark; Samuel S. Sargeant. Newark; Wm. B. Guild, Jr., Newark. David L. Wallace, M.D., Health Officer, Newark.

The work of constructing sewers through the streets of the city is progressing actively, a number of miles having been built during the past year.

Fifty thousand dollars per year is spent in repairing with oblong granite blocks, this having been done for the past five years, so that at present all our principal thoroughfares are paved with these blocks.

Up to the present time 14,283 houses have been inspected on the house-to-house inspection method, and plans of the premises are on file in the office of the Board. In this inspection 2,397 nuisances have been found and 2,298 abated; 1,260 cases of defective plumbing have been found and 1,249 of these have been rectified.

The Sanitary Code mentioned as being under passage, in last year's report, became a law in due time. Five thousand copies have been printed for the use of our citizens, and the laws as contained therein are being strictly enforced, especially as to thorough inspection of animals, both alive and slaughtered, the closing of wells the water of which is unfit for potable use, the sanitary condition of dwellings and the care of contagious diseases. The Sanitary Committee of the Board of Health are about to consult with the Directors of the City Hospital and hope before long to have a wing of that institution devoted to the care of cases of those diseases in which isolation cannot be practiced at the homes of the patients. With this an accomplished fact, the controlling of these diseases will be an easy matter.

During the past year the returns of marriages and births have been better than in previous years, but it is not yet what it should be. The City Clerk and myself have just had a circular printed, calling the attention of physicians and ministers to the passage of the law of 1888 regulating the reporting of marriages, births and deaths. In it we have stated that it is mandatory in character and must be enforced. Instead of having these returns mailed to this office, they are called for each month by the Inspectors of the Board of Health, and we find that more returns are received in this way.

During the past year 26,764 head of cattle were inspected, 36,153 hogs, 69,245 sheep, 48,898 calves, or a total of 181,060. The following were condemned: Cattle (beef), 3; calves, 67; sheep, 42; hogs, 1. The following articles were condemned in markets: Poultry, 2,045 pounds; beef, 1,965 pounds; mutton, 803 pounds; pork, 500 pounds; bologna, 430 pounds; veal, 270 pounds; rabbits (number), 62; also a large quantity of fruit and vegetables.

The following gives a summary of all work accomplished in the Sanitary Department for the year 1888: Notices served for abatement of nuisances, 2,240; abatements, 2,010; notices served to rectify defective plumbing and drainage, 970; rectifications, 899; permits granted for sewer connections, 1,272; number of sewer drains inspected, 1,063; permits granted for cleaning vaults, 2,472; permits granted for cleaning cesspools, 626; permits granted for keeping cows and goats, 686; sunken lots filled, 10.

The officers and employes of the Board of Health are as follows: Health Officer, Superintendent of Force, one Milk Inspector, one Veterinary Inspector, one Meat and Vegetable Inspector, eight Sanitary Inspectors, City Apothecary and eight District Physicians.

(Signed) DAVID L. WALLACE, M.D.,
Health Officer.

SOUTH ORANGE BOROUGH.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Edward Self, President, South Orange; Isaiah Ball, Secretary, South Orange; John A. Nugent, South Orange; Arnold Tanzer, South Orange; Henry Lilly, South Orange; Noel Martin, South Orange. A. A. Ransom, Health Inspector, South Orange.

Located about the middle of county of Essex, New Jersey. Population, 3,000. Climate as it is in Newark.

We have two great water-sheds, underlaid with trap-rock.

Water-supply is from springs, wells and from Orange.

Drainage and sewerage are private.

The streets and public grounds are the best in the State.

The houses generally are good, and well attended to.

Gas and oil are the modes of lighting.

Refuse and excreta are received in vaults; carried off by odorless company.

The markets are in good condition.

Have lost six or eight horses with cerebro-spinal meningitis, all in one barn, at Mountain House.

No slaughter-house in the village.

There is but one manufactory in the village.

Schools and school-houses are all in first-class condition.

There is no alms-house or hospital, but abound in other charities.

Police and prison are all right.

Where there is need of them, fire-guards or escapes are placed.

Have one cemetery. Burials by permit.

Our public health laws and regulations are sufficient and thoroughly executed.

Registration and vital statistics will, I think, be all right.

Contagious diseases and vaccination are thoroughly looked after.

Our sanitary expenses amount to about $500.

Improvement is being made in supplying heat and ventilation for dwellings.

During the year we have had several cases of pneumonia and rheumatism. No epidemic.

The village of South Orange contains about three and one-half square miles. Four hundred dwelling-houses, mostly detached; four churches and five school-houses. The village is entirely free from debt. (Signed) A. A. RANSOM, M.D.,

Register of Vital Statistics.

WEST ORANGE TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Edward P. Smith, President, Orange; John Otterbein, West Orange; John B. Van Wagenen, West Orange; Ephraim I Jacobus, West Orange; Robert N. Drew, Orange Valley; Levi Van Buskirk, Orange Valley; Dr. B. L. Dodd, Orange.

Water-supply is from wells and cisterns.

Drainage and sewerage are natural.

About one-third of the houses have basement kitchens.

Those that have cesspools have them cemented.

There is but one slaughter-house, and that is kept in good condition.

Have phonograph works. No evil therefrom.

GLOUCESTER COUNTY.

CLAYTON BOROUGH.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

D. W. Moore, Chairman; G. M. Tomson, Secretary; H. G. Buckingham, M.D., Geo. W. Page, Alonzo Fisler, R. M. Warner, G. R. Heisler.

Unusually good health has prevailed in Clayton borough during the year. A very few cases of malarial fever and dysentery, of mild type, during the summer and autumn months.

A civil engineer has made a survey of the village. Some of the streets have been graded and better drainage is the result.

A sanitary inspection has been made by the Board of Health, and when back yards, drains, &c., have been found to be uncleanly, the evil has been remedied.

The sanitary education of the people is improving.

(Signed) H. G. Buckingham, M.D.,
Medical Inspector.

CLAYTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Samuel F. Fisher, M.D., Clayton; Wm. A. Williamson, Clayton; Samuel C. Newkirk, Clayton; A. G. Silver, Clayton; John W. Gardner, Unionville.

DEPTFORD TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

E. Stewart, Almonesson; Chas. Pierson, Woodbury; Wm. Stevenson, Salina; E. D. Riley, Assessor.

EAST GREENWICH TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Benj. Heritage, Chairman, Mickleton; Walter Heritage, Mickleton; William H. Hoffman, Clarksboro; Henry L. Haines, Clarksboro.

Water-supply—wells.

Drainage—natural. Cellars generally dry.

Houses generally have cellars; not used for the storage of vegetables to any great extent. Tenement-houses of more than two families unknown. No inspection.

Cesspools open; emptied by shovel and used as fertilizer.

Assessor makes no inquiry as to losses of animals or contagious diseases.

No slaughter-houses.

No manufactories.

Returns not neglected to any extent.

School-houses are the ordinary country district school-houses.

Gloucester county alms-house, within township. No inspection by local authorities.

Police and prisons—none.

Eglington Cemetery within district. Incorporated under State laws. No complaints.

Heat and ventilation—heat generally by ordinary coal-stove, occasionally by heater; source of ventilation by windows.

Local Board of Health not specially organized, but no nuisances complained of.

FRANKLIN TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles Trimnel, Malaga; Charles D. Smith, Franklinville; Samuel Lowder, Newfield; A. A. Smith, M.D., Malaga; Joshua C. Richman, Malaga.

We are purely local. Our population is not in a compact mass, but is spread out over 37,000 acres of land. No towns. Malaga, the largest village, about 500.

There are a few tenement-houses in Malaga, and no others in the township.

No sickness to speak of; a healthy district.

(Signed) JOSHUA C. RICHMAN.

GLASSBORO TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

W. H. Beckett, Glassboro; John E. Pierce, Glassboro; H. Iszard, M.D., Glassboro. T. C. Allen and Dr. J. Iszard, Health Inspectors.

The water-supply is from wells and of good quality.

We have a system of drainage to carry off surface-water during rain. No sewerage. Cellars mostly dry, except in very rainy weather.

The streets and public grounds are in good condition.

Houses all have cellars, mostly of fair size and plenty of light. The houses generally are well built. We have not established the yearly house-to-house inspection.

Refuse mostly fed up. Excreta mostly carted out of town in winter.

Slaughter-houses, with one exception, are out of town.

The manufacture of glass is the chief industry.

We elected Police Magistrate and two Marshals last spring.

During the year a fire-escape has been placed on one of our public buildings.

One new cemetery is about being started out of town.

The public health laws and regulations are adhered to so far as understood.

Registration and vital statistics are sent in by the physicians of the township to the Assessor.

There have been a few cases of contagious diseases, which were kept isolated as far as possible. There has been no epidemic to require a general quarantine.

Prevalent diseases same as last year, with more scarlet fever and typhoid fever.

(Signed) H. Iszard, M.D.,
Secretary Board of Health.

GREENWICH TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jacob Ballinger, Paulsboro; E. G. Miller, Paulsboro; Joseph Devault, Paulsboro; Benjamin L. Fish, Gibbstown.

The supply of water is entirely from wells, which in the most populous parts of the township are from eight to ten feet deep. In wet times the water is sometimes discolored, being principally by surface-water. In some few cases there are driven wells. The water is generally soft.

Natural drainage.

Houses have cellars. Cellars are used to a considerable extent for storage of vegetables.

(Signed) Jacob Ballinger,
Assessor, Paulsboro.

HARRISON TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

James White, Mullica Hill; E. E. De Grofft, Secretary, Mullica Hill; Wm. Bunning, Mullica Hill; J. G. Foster, Jefferson; Allen S. Clark, Ewan's Mills.

Our water-supply is principally from wells, although there are some families that are supplied from cisterns.

We have no need for any drainage system, as nature has made ample provision for that—the villages in our township are situated upon high ground, or a considerable distance above tide-water.

All of the houses have cellars, many of which are used for the storage of potatoes. There is no yearly house-to-house inspection.

Our cesspools are built with open sides, and the excreta are removed by horse and cart, and as a rule, buried in the earth, but occasionally used as a fertilizer.

The only disease among animals in this vicinity is hog cholera, which prevails, at times, to an alarming extent.

Our slaughter-houses this year are an improvement, in cleanliness, over former years.

Our school buildings, in reference to heat and ventilation, are in excellent sanitary condition.

At the last meeting of the Board of Health, it was decided not to publish any health ordinance at present, in consequence of a depleted township treasury.

The heating and ventilation of our dwellings are in accordance with sanitary requirements, and will compare favorably with any other township in the State.

The township has been remarkably free from any prevalent disease or epidemics.

(Signed) E. E. DE GROFFT,
Secretary.

LOGAN TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Thomas J. Gaskill, President, Bridgeport; S. B. Platt, Secretary, Bridgeport; Hance Helms, Bridgeport; John Kirby, Bridgeport; E. T. Oliphant, M.D., Bridgeport.

Water-supply entirely from wells; depth from fourteen to twenty-five feet. Very seldom discolored, and in shoal wells only, in time of heavy and continual rains. Cause supposed to be surface-water. Principally hard. Some few cisterns, and water used for washing purposes only.

No system of drainage other than drain-tile in low farm lands, and in some few cases ponds are drained into creeks and meadows, and from meadows into creeks and river by tide-sluices. Usual water-level is such as to secure dry cellars, and there are few cases where water is or comes in cellars. There are large cedar swamps in the township, and some considerable tide-marsh and meadows. No malaria of any account.

Houses generally have cellars; used some little for storage of vegetables, principally potatoes for family consumption. No tenement-houses for more than two families. No yearly house-to-house inspection.

No sewers. Cesspools and privies are generally built with open sides and bottom, but of late people are taking more care in building the same and are making them tight. Contents are taken out in winter and used largely for fertilizers.

No animal diseases prevalent this year. Assessor inquires as to losses of animals and as to contagious diseases.

Slaughter-house is not in very good condition, but there is some improvement from last year by having a tight floor.

No manufactures.

No public buildings other than school-houses, and they are in a good sanitary condition.

Cemeteries are located about half a mile from town, and are on high, dry land, and burials are about four and a half to five feet deep.

Returns of vital statistics are generally promptly made.

Local Board has had no occasion to quarantine or care for any contagious diseases or vaccinations, but under our organization we can control or isolate the same.

Heat for dwellings is principally by stoves in the rooms. No system of ventilation other than doors and windows.

No prevalent diseases during the year.

(Signed) S. B. PLATT,
Secretary.

MONROE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John W. McClure, Secretary, Williamstown; J. B. Sickler, Williamstown; H. K. Busbee, Williamstown; David S. Champion, Medical Member, Williamstown; L. M. Halsey, Williamstown.

MANTUA TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John H. Sharp, Chairman; J. Mason Tomlin, Secretary; William C. Long, Mantua; J. Leo. Eldridge. Dr. E. Z. Hillegass, Health Inspector, Mantua.

The people depend on wells for their supply of water, which is all that could be desired. It is hard.

We have no system of drainage. Cellars are dry. We have some few swamps, but malaria is not very frequent; occasionally we meet with a few cases.

Our houses generally have cellars, and comparatively few are used for the storage of vegetables. We have no tenement-houses of more than two families. No yearly house-to-house inspection.

We have no sewerage. Our cesspools are built with open bottom, and the contents are carted away and buried in the soil.

We have had no prevalent diseases this year; a few sporadic cases of typhoid fever in September. The Assessor inquires each year as to contagious diseases.

Our slaughter-house is inspected daily during the months of July and August, and it gave us considerable trouble the past summer.

What few manufactories there are, we have no trouble with.

Our schools and school-houses are in excellent order.

As to our alms-house, we have had no complaint.

Our cemeteries are well kept.

Our Township Board adopted a health ordinance, as directed in Circular No. LX., for the preservation of the public health.

SOUTH HARRISON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Samuel F. Stanger, M.D., Secretary, Harrisonville; George Horner, Harrisonville; Nathan Wilkinson, Harrisonville; Alfred Lippincott, Harrisonville; Thomas Borton, Harrisonville.

Water-supply is obtained from wells and cisterns. It is hard, and during a part of the summer it is offensive and unfit for use. This summer, however, has been an exception to the rule, as our water has been pure and used for all purposes during the entire season. It is accounted for by the fact of our having numerous rains, thereby keeping our wells comparatively well filled, for it is when the springs are low that the water is foul.

During the heated term of July and August there was an unusual amount of bowel troubles, affecting all ages, but not of a very severe type, readily yielding to treatment; also several cases of scarlet fever. In the fall and early winter we had a number of cases of diphtheria and typhoid fever. There has not been as much malaria as during some previous years.

(Signed) SAMUEL F. STANGER, M.D.,
Secretary.

WASHINGTON TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John Wilkens, President, Turnerville; Chas. Nicholson, Secretary, Turnerville; Evan Davis, Huffville; Frank Allen, Huffville. Dr. C. B. Phillips, Medical Member of Health Board, Huffville.

The water-supply is by springs, dug wells and cisterns.

Drainage and sewerage are accomplished by nature.

Refuse and excreta are taken care of so as not to contaminate the air.

We had a few cases of scarlet fever in the spring, but not enough to amount to an epidemic, only one case resulting fatally; also an epidemic of influenza, with one death.

Our Local Board of Health met in July and passed several ordinances for the preservation of the public health.

(Signed) DR. C. B. PHILLIPS.

WEST DEPTFORD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John C. Budd, Thoroughfare; Alonzo P. Rambo, Thoroughfare; Joseph A. Moore, Woodbury; Louis K. Wilkins, Thoroughfare.

WOOLWICH TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. Benjamin F. Buzby, Medical Member, Swedesboro; Charles P. Batten, Swedesboro; Howard V. Lock, Swedesboro; John Moore, Swedesboro; Daniel Lippincott, Swedesboro.

The entire township depends on wells for drinking and cooking purposes; about one-third use rain-water for cleaning.

Drainage the same as all small country towns. The drainage, as far as known, causes nothing wrong. Swamps are not near, and malaria has been less than usual during the past year.

All houses have cellars, with few exceptions. They are usually used for the storage of potatoes in small quantities, and fruits. No yearly house-to-house inspection.

Coal oil, excepting in four cases, is used for lighting.

Refuse is fed to pigs, and carted out of town, by those owning them, in country; always disposed of in a manner in accordance with good hygienic measures. Excreta are carted away and buried in all cases. The people of our township seem unusually particular in regard to all subjects under this head, and as a consequence there are no bad effects to note.

No diseases among animals this year to note.

We have one slaughter-house. It is attended to right and nothing needs correcting.

The school-houses are kept in accordance with the laws of the State. Nothing to note. The public halls and lodge-rooms need attention; the doors of all *open in.*

The burial of the dead is the same as all old country towns follow. I have never noted anything objectionable which could be attributed to them.

The Local Board of Health has adopted a code of regulations and recommendations, which will be carried out, if needed, in any case.

Registration and vital statistics are all attended to properly.

Contagious diseases are so uncommon here that nothing has been demanded, so far; but our Local Board have taken care to embody such precautionary measures in their code, that, should occasion demand, full and complete measures would be immediately taken to limit the contagion. Vaccination is not attended to; the people have nothing to excite their fear, and as a consequence it isn't deemed requisite.

Buildings heated by stoves, heaters and steam. Ventilation—scientific—doesn't exist.

The past year has been one of exceptionally good health. The winter and spring were attended by diseases usually occurring at these seasons, in the usual degree; the rest of year nothing at all to note.

HUDSON COUNTY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

L. J. Gordon, M.D., President of County Board; C. J. Rooney, Jr., Clerk.

Vigorous efforts have been made by this Board, in every direction properly within its province, for the betterment of the sanitary surroundings of the people during the past year.

A thorough examination of the various ill-smelling factories on the west bank of the Hackensack was made, and by the introduction of appliances for consuming noxious and unpleasant vapors much of the objection to these places has been removed.

The storing of an immense quantity of manure near the hog abattoir, by the New York Horse Manure Company, has been a cause for action by this Board. After much discussion and consultation, the papers and reports in the case have been placed before the grand jury, and the matter is under advisement by them.

Many sewers and receiving basins in Jersey City have been repaired and cleaned by the efforts of counsel.

A sewer has been completed in West Hoboken, and one is under contract in Town of Union. One was constructed in St. Paul's avenue, Jersey City, and another is in course of construction in Laidlaw avenue, Jersey City. These have been undertaken at the instance of the Board.

Much improvement has taken place in the dairies of the county, and on several occasions the action of the counsel, H. D. Winfield, Esq., has been necessary to remedy unwholesome conditions. A much better management now is the rule.

The reporting of contagious diseases by physicians is enforced, and legal action in several cases has had the effect of securing prompter and more complete reports.

It is now requested that school principals notify the Board of any cases of contagious disease coming to their knowledge. In this way the opportunity will be afforded of keeping check upon the physicians as to unreported cases.

In the year October 1st, 1887, to October 1st, 1888, cases of contagious disease have been reported as follows: Scarlet fever, 930; diphtheria, 1,299; small-pox, 27.

	Diphtheria.	Scarlet Fever.	Small-Pox.
Jersey City	1,002	779	19
Hoboken	113	80	6
Bayonne	47	14	....
Harrison	31	4	....
Town of Union	40	26	....
West Hoboken	41	16	....
Guttenberg	2	....	2
North Bergen	19	8	....
Kearny	1	2	....
Union Township	2	....	....
Weehawken	1	1	....

Total for all cases, 2,256.

As to vital statistics, you are respectfully referred to the detailed reports sent to you monthly from this office, and to the original returns of deaths, &c.

The ordinances last adopted by this Board are also forwarded for your information, as is the report made to this Board for year 1887.

The Inspectors have attended, as usual, to complaints and cases of contagious disease. Schools have been notified to exclude children coming from infected houses. There has been much activity on the part of the Board to increase its effectiveness, and the results are quite manifest.

(Signed) C. J. Rooney, Jr.,
Clerk.

WEST HOBOKEN.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Wm. H. Righter, Chairman, No. 29 Cliff street; Levi A. Farr, Clerk, No. 4 Union street; James White, No. 45 Malone street; John W. Tanner, Hoboken street; Frederick Steinhoff, Anne street; August A. Rich, Central avenue, near Mill street. Louis Michel, M.D., Health Inspector, Paterson avenue.

The town of West Hoboken is located about the center of Hudson county, 280 feet above the level of the sea. The population is over 9,000 inhabitants.

The land forms a superb plateau bordering the Palisades. The soil is rather rocky, the contour is about two and a half miles, one and a quarter miles in length and half a mile wide.

The water-supply is furnished now by the Hackensack Water Company. The water is very clear and pure. A great many have wells, the water of which is good, and some with a slight taste of iron. The wells are always kept in good condition and clean.

Every house has some drainage connected with the different natural water-courses. We are now constructing sewers, and in the course of another year the town will have regular and proper sewerage.

One street only is paved, the others are flagged and guttered, and we are constantly opening new ones. There is only one public ground. The new town hall, in course of erection, will be finished by next April.

A great many occupy their own houses, others contain from two to four families, and some tenement-houses have been built recently to accommodate a larger number.

Kerosene oil and gas, for both streets and houses, are in use for lighting purposes.

Refuse and excreta from privies and cesspools are removed by licensed scavengers, and garbage and ashes by carts, twice a week.

This summer, on account of pleuro-pneumonia amongst the cattle, an Inspector visited our town for that purpose, and a great many cattle were removed and disposed of by his order.

The principal manufactories are several large silk factories, employing a large number of men and girls. The factories are well ventilated, and the premises kept in good hygienic condition. All the factories are provided with fire-escapes.

We have quite a large brick public school building, and one frame building in course of construction. There are also two Catholic schools (parochial), one a brick structure, quite large, and a smaller one, frame. All of the above buildings are well ventilated and provided with adequate fire-escapes.

Our police force consists of six patrolmen for night duty, two for the day, and one Sergeant, all under control of a Chief, who is a member of the Town Council. There is also a lock-up for the detention of offenders.

All dwellings are heated by stoves, few by furnaces, and all houses have proper ventilation.

The prevalent diseases of the year were scarlet fever, diphtheria, whooping-cough, intermittent and malarial fevers. During the winter whooping-cough, scarlet fever and diphtheria were epidemic, and fatal cases resulted from diphtheria and scarlet fever. Intermittent fever reigned early, almost all the spring and summer, on account of so much rainy weather. During the heated term we had very few cases of cholera infantum in comparison to the summer of 1887—consequently a less death-rate.

During our first year we received twenty-one complaints, mostly for overflowing privies, all of which were abated; numerous nuisances, consisting of bad drainage and foul cesspools, were also promptly abated. So far, we have had no recourse to law, as our notices were obeyed willingly.

(Signed) Louis Michel, M.D.,
Health Inspector.

HUNTERDON COUNTY.

ALEXANDRIA TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John G. Bonnell, Pittstown; Jonathan Kugler, Frenchtown; David Phillips, Little York; Moses D. Knight, M.D, Little York; Jacob C. Hackett, Mount Pleasant.

We have been afflicted with no epidemics.

Our drainage is fair.

Our Local Board of Health is in good working order.

BETHLEHEM TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

T. T. Hoffman, Bloomsbury; David Alpaugh, Norton; Jos. Mayberry, Junction; Jos. Dalrymple, Pattenburg; J. F. Linaberry, M.D., Bloomsbury.

In last year's report I gave you a general description not only of the places but of the surrounding country, together with its geological structure. I have but little of interest to report this year. The early part of the season was quite wet, followed by frequent rains during the summer months. And since fall set in, it has been very wet, so much so that many cellars have had from one to two and a half feet of water in them for weeks. The humidity of the atmosphere being kept up by the frequent rains has brought with it an increase of catarrhal and rheumatoid troubles scarcely ever seen at this season of the year, except under like atmospheric conditions. In our township there has been no outbreak of contagious disease amongst either animals or people.

CLINTON TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. W. E. Berkaw, Chairman, Annandale; Peter Rockafellar, Secretary, Lebanon; Charles Case, Hamden; N. W. Hoffman, Lebanon; John Knox, Lebanon.

About all we have to report is that the Board organized according to law, and that there has been but one complaint before them this year, that being in regard to the collecting of foul barley grain in and around Lebanon depot. The matter was referred to H. W. Doughty, real estate agent of said road. We received, as answer, that it would be attended to at once, but it is not permanently settled.

(Signed) PETER ROCKAFELLAR,
Secretary.

DELAWARE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jos. C. Reading, Secretary, Sergeantsville; Joseph Servis, Sergeantsville; Edward Priest, Sergeantsville; Calvin Strimple, Rosemont; I. S. Cramer, M.D., Sergeantsville.

The past year has been healthy, and we are glad to be able to report that it has been remarkably free from epidemics of any kind.

We are without any system of drainage in the township. The supply of water in this township is mostly springs and wells.

Our school-houses throughout the township are in good order and well ventilated.

Our slaughter-houses are managed very well.

(Signed) JOS. C. READING,
Secretary.

EAST AMWELL TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jos. Van Marter, Reaville; Ira Higgins, Wertsville; Theodore Craft, Wertsville; Van Dorn Lucy, Ringoes; P. A. Young, M.D., Ringoes.

FRANKLIN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Wm. J. Case, Chairman, Pittstown; E. B. Suydam, Quakertown; A. W. Emery, Sidney.

I don't see that I have anything to report. In townships like this the Board consists of the Township Committee, Assessor and one physician. I have called the committee's attention to the fact that we ought to organize more formally, and have sent them the laws concerning the same.

The health of the people in the township is good.

(Signed) E. C. TRIMMER,
Assessor, Quakertown Post-office.

FRENCHTOWN.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Frank T. Eggert, Frenchtown; Jacob C. Hawk, Frenchtown; S. B. Lyons, Frenchtown; W. C. Williams, M.D., Frenchtown; H. I. Srope, Frenchtown.

Location—on Delaware river, Hunterdon county. Population, 1,050.

Water supplied by wells, cisterns, Delaware river and creek.

No drainage except by street.

Mode of lighting—coal-oil lamps.

Refuse and excreta are carted away.

Two meat markets.

Two slaughter-houses.

Three wood-working establishments.

Four churches, one town hall, one school.

Police station, or lock-up, in town hall.

One fire-escape—A. P. Williams' building.

One cemetery.

Board of Health laws.

Dwellings are heated by stoves and heaters. Ventilation, ordinary.

(Signed) **Preston Smith,**
Town Clerk.

HIGH BRIDGE TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John R. Apgar, High Bridge; Owen Aller, High Bridge; W. C. Alpaugh, High Bridge; George M. Rinehart, Cokesbury; Stephen Apgar, Cokesbury.

Water supplied by wells. Slightly impregnated by iron. The water is fair to good.

Drainage and sewerage good.

The streets are kept fairly clean.

Very little building. The same as last report.

Mode of lighting, kerosene.

I gave you full account in my last report how refuse and excreta were managed.

We have no public health laws or regulations, except those suggested by the State Board of Health. We put them in force when necessary.

We have no quarantine. Very little vaccination.

Malaria, bronchitis and mumps, which were epidemic, were prevalent during the year, and dysentery in September. No deaths. The cases of dysentery could be traced to uncleanliness around or about the houses in which the patients were.

KINGWOOD TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Geo. W. Kugler, Tumble; Geo. W. Dalrymple, Baptisttown; Wm. G. Biggs, Kingwood; Geo. E. Dalrymple, Baptisttown; E. D. Leidy, M.D., Baptisttown.

There has been no prevalent disease in the township during the past year. The health has been good.

(Signed) **Geo. E. Dalrymple,**
Secretary.

LAMBERTVILLE.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. Geo. H. Larison, President; Geo. M. Holcombe, Jr., Secretary; Gervas Ely, John C. Sine, H. B. Kitchin, Wm. Lyman, Jno. L. Coryell.

A private company supplies water to the city. About 200 families take water. In May, June, July, August and September, it is stagnant, and tastes and smells; but few then drink it. It is fair the other months. Three hundred and fifty families use cistern water. The stream for reservoir is one of the common brooks. Surface-water comes in from rains, fields, &c. For the best water to drink, nearly all go to wells.

Common drainage, dry cellars mainly.

Nearly all houses have cellars.

Cesspools are regularly cleaned. They are uncemented. Contents carted out of city.

No prevalent disease.

Slaughter-houses are out of town; no hogs allowed kept in city.

Geo. H. Larison, M.D.

LEBANON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jacob Hipp, Glen Gardner; Joseph Fritts, Glen Gardner; Robert Ribbans, Anthony.

Our water-supply is mostly by springs, and as a general rule, is excellent in quality.

Excreta are generally disposed of by burial, and very often are left to decompose on vacant lots.

There has not been any disease among animals, with the exception of cholera among fowls.

Our butchers are careful as to the refuse, and slaughter-houses are kept clean.

Our school-houses are in good repair, and are as well built and ventilated as any in the State.

The past year has been healthy, with no epidemics.

(Signed) A. S. BANGHART,
Assessor.

RARITAN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John H. Ewing, M.D., President, Flemington; And. J. Green, Secretary, Flemington; George W. Fulper, Flemington; Myles Cunningham, Flemington; Henry H. Anderson, Cherryville.

The drainage of about sixty houses, which emptied out in a part of the town where it became a nuisance, has been conducted to a distance from any residence, so as to be of no further danger. The distance is 900 feet, and the pipes used are terra-cotta, fifteen-inch and eighteen-inch. The drainage spreads over a field in shallow ditches, the distance from nearest residence being about 500 feet.

The slaughter-houses are inspected and kept in a sanitary condition.

There have been no prevalent diseases, no epidemics, and the general health of the township has been rather better than usual.

Our bills are not all in, but the expenses will not be more than one hundred dollars ($100). The expenses are: Pay to an attorney, printing of the ordinances, printing of blanks, &c.

We have passed and had printed for distribution two hundred copies of the ordinances recommended by the State Board of Health.

Our water-supply is good and the water pure.

(Signed) JOHN H. EWING, M.D.,
President.

READINGTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Peter S. Latourette, Pleasant Run; Wm. C. Van Doren, Centreville; Fisher Pidcock, White House Station; W. W. Pursell, M.D., White House Station; David Schomp, Assessor, Centreville.

It has been very healthy in our township during the last year. Our country is rolling; good natural drainage; good water; and the people seem to realize that cleanliness is important to health.

(Signed) DAVID SCHOMP,
Assessor.

UNION TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

E. R. Robinson, Jutland; Jos. H. Exton, High Bridge; Isaac B. Case, Pattenburg; N. B. Bolieu, M.D., Jutland; Morris Stockton, Assessor, Pattenburg.

Located in the northwestern part of New Jersey. Population about 1,200. Climate is temperate.

Geology, iron ore. Topography at Norton, N. J. The mines are not worked now.

Manufactory, one peach-basket factory. Trade, farmers.

Five schools, and five school-houses. No other public buildings.

Four cemeteries, and four burials.

Public health laws and regulations are well enforced.

Dwellings are well heated and well ventilated.

No prevalent disease during the year.

WEST AMWELL TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John B. Drake, Lambertville; Edward M. Larue, Rocktown; Cornelius Dallas, Rocktown; Lemuel Phillips.

MERCER COUNTY.

EAST WINDSOR TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Joseph W. Perrine, Hightstown; Levi C. Updyke, Hightstown; D. Hart Cunningham, Hightstown; W. D. Wear, Assessor, Hightstown; Dr. George E. Titus, medical member, Hightstown; Thos. F. Pearce, Sanitary Inspector for the Borough Board of Health, Hightstown.

EWING TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

James B. Green, Wilburtha; George W. Kelly, Trenton; Hildreth M. Casper, Trenton; Geo. L. Howell, Assessor, Ewingville. No physician living in this township.

The water-supply is from wells; it is both hard and soft, and good.

Natural drainage.

The cellars of the houses are used largely for storing vegetables.

We have public health laws and regulations.

The township is very healthy.

HAMILTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

W. C. R. Hart, Trenton; Amos Cole, Yardville; Joshua Lee, Trenton; John Sykes, Assessor, Trenton.

The township has a poor-house, kept in good condition, and the inmates are well cared for.

The cemeteries are all kept in proper condition.

The Board of Health observe the statutes regarding their government.

Registration and vital statistics are properly attended to according to law.

The children are vaccinated, and precautions are taken against contagious diseases.

HIGHTSTOWN.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Thomas Mason, President, Hightstown; Thos. C. Pearce, Secretary, Hightstown; F. B. Budlong, Hightstown; George Y. Wood, Hightstown; Chas. Manlove, Hightstown. T. F. Pearce, Health Inspector.

Water-supply from wells.

Surface drainage.

Streets in fair condition.

Frame houses, mostly occupied by single families, very few having more than one family, and none over three families.

Refuse and excreta are burned up and carted away for manure, by night-soilers.

Markets are stores and corner groceries.

Two slaughter-houses in town, which are generally kept in good condition. Some complaints during summer.

There are two shirt factories, one laundry, one straw cover factory, two cigar factories, two iron foundries, one sash and blind mill, one canning factory, all in good condition. No complaints.

Peddie Institute, Home Seminary and public school. Some complaint as to the sewerage of Peddie Institute, which flows into the mill-pond at the side of the town, where ice is procured for general use.

The cemetery is a quarter of a mile from the built-up part of the town, on an elevation.

Public health laws and regulations are made by this Board by ordinance.

All vital statistics are forwarded to the State Board of Health by the Borough Clerk, and no record kept here.

Have had no quarantine, no contagious diseases, and vaccination is general.

Sanitary expenses raised by tax.

Dwellings are heated by stoves and steam heaters. Ventilation as usual in small towns.

The town has been very healthy.

(Signed) THOMAS C. PEARCE.

HOPEWELL TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John Fleming, Pennington; S. A. Wear, Hopewell; Wesley Case, Lambertville; J. C. Harrison, Hopewell; E. L. Welling, M.D., Pennington.

Nothing special to report this year.

(Signed) J. C. HARRISON,
Assessor.

LAWRENCE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Joseph Slack, President, Trenton; Isaac D. Baker, Secretary, Lawrence Station; James G. Phillips, Trenton; Samuel Hunt, Lawrenceville.

Water-supply, wells.
Drainage and sewerage. Some at Lawrenceville.
One case of typhoid fever.

PRINCETON.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. J. H. Wikoff, President, Princeton; Jas. R. Drake, Secretary, Princeton; Dr. E. H. Bergen, Princeton; Prof. H. B. Cornwall, Princeton; A. L. Rowland, Princeton; Jas. Van Deventer, Princeton. Jas. K. Brown, Health Inspector, Princeton.

The questions have all been answered in former reports, from which there is no change worth mentioning.

(Signed) JAS. R. DRAKE,
Secretary.

TRENTON CITY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

G. D. W. Vroom, President; William Cloke, Secretary; Thomas S. Chambers, Dr. Cornelius Shepherd, William Hewitt, Joseph T. Ridgway, Lawrence Farrell.

The operations of the Trenton Board of Health during the past year have been fairly satisfactory, and productive of some excellent results. The sanitary condition of the city has been uniformly good, and the public health well maintained. Since my last report, the Board has adopted a new Health Code. It was prepared with great care by James Buchanan, Esq., the solicitor of the Board, and a committee appointed for the purpose. It is based upon the general act of 1887, takes up *seriatim* the subjects therein placed under the jurisdiction of Local Boards, and exhausts the powers thus conferred. It has been pronounced by competent authority the model Health Code for cities of this State.

Within the past months the portion of the general system of sewerage for Trenton that was undertaken has been completed, and will be opened to public use as soon as it has been formally accepted by Common Council. It covers most of the densely-populated central and business parts of the city. Still further extensions of the system will undoubtedly be made, however, next spring and summer.

Since last year the Board has found it necessary, by reason of the large increase of its jurisdiction and duties produced by the annexation of Chambersburg and Millham, to appoint an Assistant Health Inspector. It selected as such official the Health Officer of the late borough of Chambersburg, Mr. James H. Tindall.

The following extract from the annual report of Health Inspector McGuire, lately submitted, will give such other information in regard to the work of the Board during the past year as you need:

"The city has been free from epidemics during the past year, and the general health has compared favorably with the preceding year.

"There have been reported at this office twenty cases of diphtheria, nineteen cases of typhoid fever, one case of varioloid, one case of scarlatina, and one case of enteric fever, by the attending physicians.

"I am compelled to make the usual complaint of physicians failing to report all the cases of contagious diseases coming under their charge; also of undertakers failing to report all deaths from contagious diseases.

"I have received at this office 795 complaints of nuisances; have served 652 notices by mail, and 173 personally; have issued 1,175 scavenger permits, and have made 1,234 house-to-house inspections.

"During the year I have made numerous inspections of the city alms-house, and have always found the interior of the building in good sanitary condition, the rooms being light, cheerful, well ventilated and clean, and the inmates of this institution are well supplied with good, wholesome food.

"I frequently visit the county jail and the State Prison, and always find them in excellent sanitary condition, with the exception of their being overcrowded.

"In visiting our public schools I find the system of ventilation totally inadequate.

"I have frequently visited our city markets and find the food-supply most excellent and the buildings kept in as good a sanitary condition as can be expected without a system of sewerage.

"I have made frequent inspections of the milk-supply of the city, and am glad to report that during the year there have been no prosecutions for selling adulterated milk, and in this respect Trenton shows a better report than any other city of its size in our State.

"Oleomargarine and spurious butters have been driven out of the markets owing to the vigorous measures of the State Dairy Commissioner. In my food inspections among grocers, I am informed that while they desire to sell pure goods they are often imposed upon by parties selling them impure goods. I have taken a number of samples of lard, and the result is that while every sample taken from our own city manufacturers has been found to be pure, two-thirds of all that is sold by retail grocers was found to be adulterated. This is known as Western lard.

"I have communicated with Dr. William K. Newton, the State Dairy Commissioner, and he informs me that prompt action will be taken to protect our merchants against these deceptions.

"The water-supply is very good. Forty wells of impure water have been abandoned and city water put in."

The Board holds meetings every fortnight with considerable regularity, and the members of the Board are prompt, faithful and intelligent in the discharge of their duties.

(Signed) WILLIAM CLOKE,
Secretary.

WASHINGTON TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William Coleman, Chairman, Windsor; Forman Hutchinson, Windsor; Harrison Yard, Robbinsville; Dr. Geo. H. Franklin, Windsor; John B. Yard, Assessor.

The general health of Washington township never was better. There is very little sickness at present, and the township has been very healthy the past year.

(Signed) JOHN B. YARD.

WEST WINDSOR TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Joseph H. Grover, Princeton Junction; Jacob R. Wickoff, Dutch Neck; William J. Tindall, Edinburg; Liscomb T. Robinson, Dutch Neck; S. Judson Allen, Lawrence Station.

We have no contagious diseases. Inhabitants generally healthy.

MIDDLESEX COUNTY.

CRANBURY TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

A. S. Mason, Cranbury; A. S. Stults, Cranbury; J. S. Stults, Cranbury; Dr. A. H. Symmes, Cranbury; S. J. Chamberlin, Assessor, Cranbury.

Nothing of importance to report. Everything seems to be in accordance with the law. No prevalent diseases. Health generally very good the whole year.

(Signed) S. J. CHAMBERLIN,
Assessor.

EAST BRUNSWICK TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John O. Cozzens, Spottswood; John H. Perdun, Milltown; Conrad Kohlhepp, Milltown; Benjamin Peterson, Assessor, South River; John C. Thompson, M.D., South River; Stephen M. Disbrow, M.D., Old Bridge.

The township of East Brunswick is the central township of Middlesex county, bounded northerly by the Raritan river, easterly by the South river, southerly by South river, Monroe township and Manalapan brook, westerly by South Brunswick township and Lawrence brook. The population has increased steadily since 1885, but it is impossible to state exactly what it is.

Water is supplied by wells and cisterns. As this is mostly a farming community there is no uniform system of drainage.

The houses are generally frame, and are mostly occupied by their owners. The cellars on the farms are generally used for dairy purposes and storage of vegetables.

The town of Washington, population about 1,500, is within the limits of the township. There is no organized Board of Health for the town. In the town of Washington there is a manufactory for making handkerchiefs, shirts, &c.; also five brick-yards for making common brick.

The Borough Commission of Helmetta was formed and incorporated last spring. It contains about 200 acres, and is situate within the limits of East Brunswick township. The dwellings are mostly owned by the George W. Helme Company, and occupied by their employes, who are employed in the manufacture of snuff and tobacco. Population, about 250.

There are 7 public school-houses in the township of East Brunswick. They are mostly well built and in good condition.

The town of Washington has a public hall and lock-up for persons offending the ordinances of the town. It has Marshals to enforce order and keep the peace.

(Signed) BENJAMIN PETERSON,
Assessor.

MONROE TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Samuel Buthen, Hightstown; Wm. Redmond, Jamesburg; John Lewis, Jamesburg; Chas. T. Hoffman, Assessor, Jamesburg.

NEW BRUNSWICK.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Henry R. Baldwin, M D., President; Chas. H. Voorhees, M.D., H. Brewster Willis, Peter S. Austen, Ph.D, P. A. Shannon, M.D; Henry B. Cook, City Clerk. A. Van Nest Baldwin, M.D., Secretary and Inspector.

The water is supplied by public works. The water has been as good as usual during the year. It is sometimes discolored by vegetable matter, which is greatest during the months of July, August and September. The reservoirs and pipes are cleaned by flushing as often as necessary. The stream which feeds the pond from which the water is taken is inspected by the Water Commissioners. There is no sewerage entering into the stream or pond. The water is very generally distributed over the city, and comparatively few wells and cisterns are used.

There is no system of drainage distinct from sewers, save such as is afforded by the drains from cellars and that secured by cesspools.

The water-level in the lower streets is so high that almost all cellars are damp and unhealthy. No swamps exist in the city limits, and there is no marked prevalence of malaria.

The sewers where placed are for the most part adequate; still, instances of overflow and inundation of dwellings have occurred. The houses of the city, for the most part, have cellars, and many basements are used as rooms for living.

The tenement-houses, for the greater part, are in fairly good condition. Where the city is sewered, more than one-half the houses are connected therewith.

The cesspools are mostly made with open sides and bottoms, and, when full, are emptied by the scavengers. The contents, as well as that from privies, are taken out of the city limits for purposes of fertilization.

No disease can be said to have existed as an epidemic, and yet we have to record as many as forty deaths from diphtheria in our twenty thousand population, and this does not include twenty-eight deaths from what is reported as membraneous croup. The Board regrets to state that there have been a great deal of neglect and carelessness in the reports of contagious diseases. The Board now has a method for the permanent recording of these diseases, and if in the future the returns be made promptly, considerable can be done to prevent the income of an epidemic and valuable statistics can be compiled. The Board has given public notice to the effect that a continuance of this neglect will not be overlooked, but the penalty will be enforced.

The keepers of our cemeteries and burial-grounds, with the exception of one, do not demand a burial permit, and in consequence the undertakers are negligent in obtaining them. The Board has notified them of the recent law and with the penalty for non-compliance therewith.

The Board of Health wish to acknowledge the interest shown on the part of Common Council in the work of the Board, and to express their thanks to that body in the appointment of a committee of conference.

(Signed) A. VAN NEST BALDWIN,
Secretary.

NORTH BRUNSWICK TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John A. Wines, Milltown; Philip Kuhlthan, Milltown; H. E. B. Dennison, New Brunswick; John N. Bodine, Franklin Park.

The water-supply is from wells, and is both hard and soft, and from some of the wells has an iron taste. None receive their drinking-water from cisterns.

As a general thing the houses have basements or cellars, which are used in the winter for storage.

The Assessor made inquiry as to losses of animals, and to contagious diseases, and found none.

Slaughter-houses were found in a bad state, and notice was given to have the same taken better care of.

PISCATAWAY TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Warren Smalley, New Brunswick; Alvah Gray, Dunellen; Firman Walker, New Market; A. S. Coriell, Assessor, New Market; W. J. Nelson, M.D.

There is nothing of importance to report this year, as we have had no unusual amount of sickness, no epidemics, and there has been no changes in drainage or water-supply or modes of lighting, &c. The only change is the erection of a new public school building.

(Signed) W. J. Nelson, M.D.

RARITAN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Luther H. Tappen, Chairman, Metuchen; Theo. A. Wood, Secretary, Metuchen; Samuel Laforge, Metuchen; Alfred Mundy, Metuchen.

There is nothing new to report from this township.

(Signed) Theo. A. Wood,
Secretary.

SAYREVILLE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

C. W. Fisher, Secretary, Sayreville; Wm. F. Fisher, South River; M. S. Higbee, South Amboy; Michael Salmon, Sayreville; J. H. Beekman, M.D., Sayreville.

Location is good; bounded on the west by the South river, on the north by the Raritan river, on the south by the Pennsylvania railroad, while the east verges to a point on the Amboy bay, with a railroad running through the center, from east to west. Climate, healthy. Population, about 3,000.

Country undulating, consisting of sand hills and clay hills, underlaid with clays suitable for terra-cotta, pottery, brick, tile, &c.

Abundant springs and very good in some portions. Under clays the water contains alum, magnesia, iron and lime.

The Town Committee organized as a Board of Health in October, 1888. Heretofore there has been no regulation as to health or anything in that line.

Registration and vital statistics are given through the Assessor. Ministers, physicians, undertakers and midwives fail to render them complete, and all through a lack of interest in such matters. I have written to them and also sent each one a copy of the law.

So far as cattle and horse diseases are concerned, they have been looked after by the State Board of Health.

Vaccination has been neglected, and in case of an epidemic there are no provisions made.

Malaria exists here, not among the older inhabitants, but principally among new-comers.

(Signed) C. W. Fisher,
Secretary.

SOUTH AMBOY BOROUGH.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Bernard Roddy, President, South Amboy; W. C. Perrine, South Amboy; Cornelius McGonigle, South Amboy; F. E. Degraw, South Amboy; P. Campion, South Amboy; I. Mulholland, South Amboy; J. Scully, South Amboy. G. Cheeseman, Health Inspector.

The township of South Amboy, now a borough, has 700 acres.

The borough has no sewers, but the ground has a regular descent to the bay.

Very little malaria.

Streets in good condition.

Houses generally have cellars or basements.

About 100 houses occupied by two families.

No sewers.

No prevailing disease the past year.

Slaughter-houses in good condition.

Vital returns well attended to.

(Signed) A. V. APPLEGATE,
Assessor.

SOUTH BRUNSWICK TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

J. S. Bennett, Jamesburg; H. E. Hathaway, Kingston; W. W. Cozzens, Dean's Station; F. G. Stevenson, Assessor, Dayton.

WOODBRIDGE TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Ephraim Cutter, President, Woodbridge; Samuel P. Harned, M.D., Woodbridge; Isaac Inslee, Woodbridge; Bernard Dunigan, Woodbridge; John Lockwood, Woodbridge.

Location, Middlesex county; population, 4,300; climate healthful, and, being near the ocean, the air abounds with humidity.

The water-supply is from wells and cisterns. At Lewaun a large well supplies the village.

No sewers, and surface drainage. Much low land near the town. Many cellars are wet in a certain part of the town, near what is known as Edgar's brook.

Houses generally have basements or cellars. In the country cellars are largely used for the storage of vegetables. In the town not many basements are used as dwellings. Twenty tenement-houses with more than two families. No house-to-house inspection. The Board has no Inspector.

Cesspools are used, many with open bottoms. Emptied by day laborers. Contents used by the farmers for fertilizers.

No prevalent diseases.

Seven public schools, all in good condition. The Woodbridge High School has about 500 pupils.

One poor-house, located on a farm at a distance from the town.

There is a lock-up in which prisoners are temporarily confined.

Four cemeteries, which are in good condition.

The public health laws of the township are those adopted in a code of ordinances, June 17th, 1887, and duly published.

There has been no occasion for quarantine during the year. If contagious disease occurs, the Board of Health see that the house is isolated, and access to the same is prevented.

The Board have expended during the year $61.35 for sanitary purposes, and $100 for legal expenses.

Dwellings are heated by furnaces and stoves. Ventilation about the same as in other towns.

There has been more than the usual prevalence of diarrhœa and rheumatism in the township during the year.

In the month of May last a case of small-pox occurred at a place known as Union Landing, on Staten Island Sound, in the eastern portion of the township, at the fertilizer factory of Williams, Clark & Co. The man was removed to a tent at a distance from the tenement-house where he was taken sick. He was attended by Dr. W. C. Cladik, of Rahway. The case was a virulent one, and after a short sickness the patient died. Luckily, the disease did not spread, and there were no other cases.

(Signed) EPHRAIM CUTTER,
President.

MONMOUTH COUNTY.

ASBURY PARK BOROUGH.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Wm. D. Pennypacker, President; R. Ross, Clerk; N. E. Buchanon, Jas. A. Bradley, E. Wright, John Rockafeller, E. G. Harrison, David Harvey, Jr.; H. Mitchell, M D., Medical Officer; W. B. Christine, M.D., Chemist. P. L. Lippincott, Health Inspector.

The usual work of inspection of premises has been continued, the Inspector using his time in this manner when not employed in other ways.

Water analysis has gone on slowly, samples from 225 surface wells having been examined by us since October 1st, 1887. Of this number sixty-one have been found to be polluted and ordered closed. The public water-supply has been largely increased during the past year, and the service has proved satisfactory. The quality of the water has not changed, but continues to be good. The number of water-takers is now 559, an increase of 184 since October 1st, 1887.

The sewers have continued to do their work satisfactorily, and no annoyance has been caused by them. The number of sewer connections has increased during the year to 715.

The storage of manure has occupied the attention of the Board to some extent during the past season, and permits are now given for manure-vaults only where these objectionable structures seem unavoidable. Water-tight floors, saucer-shaped, on the ground surface, are preferred, because fermentation in the manure stored on such floors goes on more slowly, and because each removal of manure from them leaves a clean, dry surface, and little stench is caused when the removal occurs. A water-tight roof is required to be placed over such open floors.

Fourteen cases of scarlet fever have been reported during the year; no deaths. Two cases of diphtheria reported; one death. One case of typhoid fever has been reported; this was an imported case, the patient becoming sick within two weeks after taking up her residence here; the case recovered. No case of typhoid fever has originated in Asbury Park since the public supply of water was introduced—July, 1885.

Electric lighting for streets has been adopted during the past year. Forty arc-lights, of 2,000 candle-power each, have been placed in the borough. The annual cost is $4,000.

Garbage is still collected under contract, at a cost of $1,500 per annum. The service is not entirely satisfactory, but it is fairly performed. Rubbish is collected separately. This service is well performed and it is of great value. The carts take all refuse which is placed on the sidewalk or in the street, and the result of this regular gathering up of trash clears out back yards, cellars and vacant lots of an immense quantity of unhealthful material. The rubbish is taken to a dumping-ground and burned daily.

The expenses of the Health Department are still paid by Mr. James A. Bradley. In accordance with the provisions of Chapter LVI., Laws of 1888, an ordinance was adopted July 20th, 1888, to regulate the plumbing and drainage of buildings.

The accompanying blanks have been printed to aid in executing the foregoing ordinance.

(Signed) RANDOLPH ROSS,
Clerk.

		How many?	Pattern or Name.	How Supplied with Water?	How is Apartment Ventilated?	Distance of Trap from Vertical Soil Pipe.	How are Tank Overflows Trapped.	How are Water Closets Trapped?	How are Traps Vented?	Size of Vent Pipes.
WATER CLOSETS.	Yard									
	Basement									
	First Floor									
	Second Floor									
	Third Floor									
WASH BASINS.	Basement									
	First Floor									
	Second Floor									
	Third Floor									
	Fourth Floor									
BATH TUBS.	Basement									
	First Floor									
	Second Floor									
	Third Floor									
SINKS.	Yard									
	Basement									
	First Floor									
	Second Floor									
	Third Floor									
	Fourth Floor									
URINALS.	Yard									
	Basement									
	First Floor									
	Second Floor									
WASH TUBS.	Basement									
	First Floor									
	Second Floor									
SLOP HOPPERS.	Yard									
	Basement									
	First Floor									
	Second Floor									
	Third Floor									
	Fourth Floor									

DESCRIPTION OF PLUMBING AND DRAINAGE PLAN.

No..................

To the Board of Health:

As required by Section 2 of the Ordinance of the Board of Health of the Borough of Asbury Park ("To regulate the plumbing and drainage of buildings, and to secure their sanitary condition"—adopted July 20th, 1888), the following DESCRIPTION and accompanying DRAWING are this day........................18.....submitted for approval, and we, the undersigned, hereby agree to do all the drainage and plumbing in the house herein specified, in accordance with the Ordinance of the Borough of Asbury Park.

Location.......................................St. or Ave..........................side...............
...............feet from.........................St.
Owner..
Address..
Plumber...
Address..

WRITE ALL ANSWERS IN INK.

1. Size of lot?...
2. Ground surface of lot already covered by buildings?..................................
3. Surface to be covered by proposed building?..
4. Number of stories, exclusive of cellar?...
5. Is there a cellar?..................... 6. How is it to be ventilated?..................
....
7. How are foundation walls to be constructed?...
....
8. How is cellar bottom to be made water-tight?...
9. Is there to be a basement?...
10. For what purpose is basement to be used?..
11. For what purpose is the building to be used?...
12. Total number of rooms in building?..
13. Are all rooms lighted and ventilated by windows opening directly to the external air?...
14. Are fan lights placed over the doors of bed-rooms?.......................................
15. Does each bed-room contain at least 800 cubic feet of space?..........................
16. Where does the main drain terminate?...
17. Is house-drain above or below cellar floor?...
18. Size of main drain?......................... 19. Size of soil pipe?.........................
20. Where does air-inlet open?
21. Material of pipe?..
....
22. Size of vent pipes?...
23. Is there a separate vent pipe?..
24. If the cellar floor is of concrete or cement, and covered by a wooden floor, is space beneath wooden floor ventilated?................. How?.............................

NOTE.—Drawings shall in each case be furnished to accompany this written description. They shall show every line of supply and waste pipe, and every fixture, and the location of every stop-cock. They shall also show which way the contents of every pipe flow, and the sizes of all pipes between given points.

OFFICE OF THE BOARD OF HEALTH,
Asbury Park, N. J......................... .... *18*...

This DESCRIPTION OF PLUMBING AND DRAINAGE has been examined, and it is

....

....

....

[ENDORSEMENT.]

Form XVI.

BOARD OF HEALTH OF THE BOROUGH OF ASBURY PARK.

DESCRIPTION OF PLUMBING AND DRAINAGE PLAN.

No...................

No.. Street.

Filed..18......

Inspected...18......

....

....

....18......

Final inspection shows that all work has been done in accordance with this Plan and Description and the Ordinance of the Board of Health.

....

Inspector.

No...... Form XVIII.

Certificate of Approval of Plan.

.................18

Structure..Old or New..Stories..

Lot No...........Street No.........

Owner..............................

Plumber............................

Remarks............................

....

....

....

EXTRACT FROM ORDINANCE GOVERNING PLUMBING AND HOUSE DRAINAGE IN THE BOROUGH OF ASBURY PARK.

SEC. 2. Before any portion of the plumbing and drainage system of any building shall be constructed or reconstructed, there shall be filed in the office of the Board of Health a plan or drawing and written description thereof, signed by the owner, showing the said plumbing and drainage system entire, from its connection with the sewer, cesspool or vault throughout the entire building, together with the location of all fixtures, traps, ventilating pipes, etc. No portion of the said plumbing or drainage work shall be executed until said plans and drawings and written description thereof shall have been approved in writing by the Board of Health. Before approval, said plans, drawings and descriptions shall be signed by the plumber. After a plan has been approved no alteration of the same shall be made except upon the written application of the owner. Written descriptions shall be submitted on blanks provided by the Board of Health. Said descriptions shall clearly explain all portions of the proposed construction not clearly set forth in the plans or drawings. The work must be executed strictly in accordance with the approved plans, drawings and descriptions. This regulation also applies to any extensions or alterations of existing systems, with the addition that in such cases a plan of the old system, as well as a plan of the proposed changes, must be filed in the office of the Board of Health. Drawings and descriptions of the plumbing and drainage of buildings erected prior to the passage of this regulation may be placed on file in the office of the Board.

No......... BOARD OF HEALTH. Form XVIII

Certificate of Approval of Plan.

Asbury Park, N. J.............................*18*

This certifies that.......................................has filed in the office of this Board a plan and description of Plumbing and Drainage Work proposed to be placed in and upon building erected on Lot No.................., to be known as No.................. Avenue, Street, owned by.......................................and that upon careful examination said plan is found to be satisfactory, and in accordance with the regulations governing plumbing and house drainage in the Borough of Asbury Park, and the same is hereby approved.

....

No...... Form XVII.

Certificate of Approval of Work.

..................18

Structure...Old or New...Stories...

Lot No............Street No............

Owner.................................

Plumber...............................

Remarks...............................

....

....

....

EXTRACT FROM ORDINANCE GOVERNING PLUMBING AND HOUSE DRAINAGE IN THE BOROUGH OF ASBURY PARK.

SEC. 88. Every new plumbing system, including those altered or extended, must be tested by the plumber by the air test, in the presence of an authorized officer of the Board of Health; all defective joints must be made tight, and other openings made impervious to gases. Defective pipes must be removed and replaced by sound pipe.

No......... BOARD OF HEALTH. Form XVII.

Certificate of Approval of Plumbing Work.

Asbury Park, N. J.................................18

This certifies that I have this day made careful inspection of Plumbing and Drainage work placed in and upon building erected upon Lot.......................... known as No..Avenue, Street, and find same satisfactory and in accordance with the regulations governing plumbing and house drainage in the Borough of Asbury Park.

....

Inspector of Plumbing.

ATLANTIC TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Samuel T. Vandeveer, Colt's Neck; John T. Haight, Colt's Neck; S. Schanck Holmdel; Levi Scobey, Assessor.

EATONTOWN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Joseph Johnston, Eatontown; Jas. E. Borden, Eatontown; Nicholas V. White, West Long Branch; Wm. R. Stevens, Assessor, Eatontown. E. W. Crater, M.D., Health Inspector, Oceanport.

Water-supply from wells and cisterns. Water rather hard; slightly brackish at eastern end of township.

No public drainage or sewerage system. Many houses have cellars containing water the year round. Considerable swamp area. Very little malaria.

No house inspection unless suspicious cases are reported—as when typhoid fever or diphtheria occur.

Everything is thrown by everybody down the water-closet—"*Requiescat.*"

Hog cholera is more or less prevalent every summer. It rarely makes its appearance until boarding-house refuse, technically known as "sea swill," is fed in unlimited quantities; it is very fatal, often destroying entire herds.

Slaughter-houses very well kept.

Schools, both public and private, are plentiful, well kept, well lighted and ventilated. I shall shortly make a tour of inspection.

Cemeteries all well kept, and interments made, so far as known, at regulation depth.

(Signed) E. W. Crater, M.D.

FREEHOLD.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John Bowden, Freehold; O. R. Freeman, M.D., Freehold; Aaron C. Hart, Freehold; O. R. Burtt, Jr., Freehold; John Enright, Freehold. W. J. McClure, Health Inspector, Freehold.

The town of Freehold, since the last report of the Board of Health, has extended its limits somewhat, and now includes within its boundary the premises occupied by the Freehold and New York Railway Company, a large shirt factory employing 300 to 400 hands, and a canning factory. This extension makes an increase in our population and it is estimated that the town now numbers about 2,500 inhabitants. The Board of Health is organized under the new law, and in accordance therewith appointed an Inspector, to whom all complaints are made. Notices to abate nuisances are more readily complied with than formerly.

Complaints of persons keeping swine, and of filthy accumulations on such premises, have been in their usual order, and the Board reports progress, and hopes before another season to free the town of these abominations.

We have had several complaints from persons living in the vicinity of the slaughter-house of offensive odors from rendering of fat and refuse. A notice to discontinue the practice and remove to other quarters has produced good results, and the residents in that section will not be annoyed in the future.

The health of the town continues good, and there has been a general compliance with the ordinances on the part of the inhabitants.

HOLMDEL TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Michael Taylor, Holmdel; Wm. Morrell, Hazlet; Jas. W. Hoff, Keyport; Aaron Longstreet, Assessor, Holmdel.

HOWELL TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jacob Lutz, Farmingdale; Charles Donahay, Turkey; James H. Butcher, Assessor, Turkey. Stephen A. Disbrow, Township Physician and Health Inspector, Farmingdale.

KEYPORT.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

S. V. Arrowsmith, Keyport; Dr. D. E. Roberts, Keyport; Gilbert Devoe, Keyport; Sylvanus Lee, Keyport; J. D. Hopkins, Keyport; A. F. Bedle, Keyport. Jas. M. Walling, Health Inspector, Keyport.

Water-supply from wells.

No system of drainage. In portions of the town the cellars are wet.

About twelve tenement-houses, most with cellars.

Very few houses connected with sewers. Cesspools are built with open bottom and sides; contents used for fertilizers.

Light epidemic of diphtheria and scarlet fever, in the winter months of 1887 and 1888.

No slaughter-houses.

No factories.

(Signed) A. F. BEDLE,
Secretary.

LONG BRANCH.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

W. W. Silkworth, President, Long Branch; E. B. Blairdell, Secretary, Long Branch; Geo. W. Brown, M.D., Long Branch; J. W. Taylor, M.D., Long Branch; Alexander Cooper, Long Branch; J. P. Connelly, Long Branch; Charles Morris, Long Branch. Hugh R. Herbert, Health Inspector, Long Branch.

MATAWAN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Garret Hendrickson, Matawan; William A. Close, Matawan; John F. Sirk, Matawan; Richard Bedle, Assessor; Dr. C. Knect, Township Physician.

There is nothing much that I can say in regard to our system of health regulations, as our Borough Board does not act, and at present we have none but the Township Board.

The health of the township and town has been very good for the year past. No epidemic has visited us.

Our water-supply is from springs and wells.

Drainage natural.

(Signed) RICHARD BEDLE,
Assessor.

MANALAPAN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

J. C. Sutphen, Clerk, Tennent; Wm. C. Bowne, Freehold; Wm. H. Reid, Tennent; H. W. Long, Englishtown; A. T. Applegate, Physician, Englishtown; S. C. Bowne, Assessor, Englishtown.

The water-supply is from wells and springs; it has some iron in it, and is both soft and hard.

Surface drainage and under drainage.

Malaria is frequent. Sewerage is by two rows of ten-inch earthen pipes, which have an outlet in a raceway; the fall is 2 feet to 100 feet; the whole length of sewer system is 400 feet.

Lighting is by kerosene lamps.

Assessor made inquiry, and found no prevalent disease.

Slaughter-houses are kept in good order and are no nuisance.

There are one file factory, one canning factory and one shirt factory.

School facilities are kept up to the ordinary standard.

The health laws and regulations are those of the State Board of Health.

Registration is looked after, and vital statistics are recorded and forwarded by the Assessor.

There has been no quarantine. The Board is governed by the law, in regard to vaccination.

There has been no prevalent disease.

(Signed) H. C. BOWNE,
Chairman.

MARLBORO.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William Carson, Holmdel; Peter C. Vandeveer, Wickatus; William C. Hulse, Marlboro.

MIDDLETOWN TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George Morford, President, New Monmouth; R. S. Snyder, Secretary, Middletown; J. H. Brainard, Highlands; J. H. Van Mater, M.D., Atlantic Highlands; D. D. Hendrickson, M.D., Medical Member of Board, Middletown.

The year has passed without any prevailing disease in our bounds. The natural advantages of the locality have made it the most delightful and healthful resort for city people of any locality within reach of the summer visitors.

There is now a borough within our limits, at Atlantic Highlands, well organized, and being appreciated by New Yorkers purchasing and building their homes where they can enjoy the mountain and ocean scenery and pure spring-water. This has, in its limits, some 500 acres of eligible building lots and grounds. Nearly all depend on spring-water or wells reaching supplies from the springs. There has not, as yet, been any other than private arrangements for drainage or sewerage, and no demand for any. There is a sufficient natural supply from these sources to flush and cleanse all necessary parts of the premises. Indeed, there has been no complaint to the Board of Health since its spring organization that necessitated any more than the passing of ordinances to educate some localities to be cleanly and watch ful as to any cause for action of this Board.

There are still two fish-scrap factories at Port Monmouth, but they have shown diligence in their efforts to prevent any unhealthful odor.

While we have no report to make of any prevailing disease or of any contagious cases, we feel that the need of organization in every place is imperative, and have reason to appreciate the efficient co-operation of your State Board in sending all needful helps and directions in the contingency that may arise in a township adjoining the ocean and bay, where a foreign cause of contagious disease may easily be landed on our shores. "To be forewarned is to be forearmed."

(Signed) R. S. SNYDER,
Assessor.

MILLSTONE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Geo. M. Davison, Perrineville; Albert Thompson, Clarksburg; Rainbert Ely, Ely; A. B. Johnes, Assessor, Perrineville.

We have a clear, open country, and generally healthy.

There are no cities nor large towns in the township.

The water is supplied by sunken wells and clear running streams.

As to drainage, there is no particular system, except what the farmers do to dry their lands.

There are no streets or public grounds other than the highway.

The houses are generally frame buildings, with cellars for family use only. Seldom more than one family in a house.

No sewers or cesspools.

No prevalent diseases of man or animal.

No slaughter-houses.

(Signed) A. B. JOHNES,
Secretary.

NEPTUNE TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Samuel W. Kirkbride, Asbury Park; Dr. H. S. Kinmouth, Asbury Pary; Amos Trilton, Hamilton; John C. Patterson, Ocean Grove. E. H. Watrus, Health Inspector, Ocean Grove.

The water-supply is furnished by the Ocean Grove Water Works, sixty-four houses having connection with the same.

West Grove has good sewerage. West Park is not as well off in that way; have to have tight vaults. As to drainage, most of the cellars are dry. There are some swamps back of West Park and West Grove, and there are some cases of malaria, but not as much as two years past. As to sewers in West Grove, they are on the Ocean Grove system, which seems to be very good.

Houses generally have cellars.

There is a house-to-house inspection.

Only one slaughter-house, and that is kept under close inspection.

OCEAN BEACH.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jas. S. Huyler, President, Ocean Beach; Thos. Dunbar, Jr., M.D., Ocean Beach; Jacob Titus, Ocean Beach; William L. Kinmouth, M.D., Ocean Beach; Frank P. Philbrick, Ocean Beach; William Bergen, Ocean Beach. Chas. S. Wolverton, Health Inspector.

Water is supplied by driven and artesian wells; irony taste; generally hard.

The usual water-level is not such as to secure dry cellars, in general. No drainage distinct from sewerage.

Houses generally have basements; used only in summer months. There are no tenement-houses. Yearly house inspection.

Cesspools are made with brick sides and bottoms, and cemented; emptied with air-tight wagons; carted outside of the borough, and used as fertilizer.

No prevalent diseases. Have a register of persons keeping horses, cows, hogs, &c.

There are no slaughter-houses.

OCEAN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

James W. Conover, Deal; William Warner, Long Branch; Abraham T. Vandeveer, Long Branch; Joseph H. Cooper, Assessor, Long Branch.

OCEAN GROVE.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

E. H. Stokes, President, Ocean Grove; J. L. Hays, Ocean Grove; Holmes Murphy, Ocean Grove; Jos. H. Thornley, Ocean Grove; I. H. Alday, M.D., Ocean Grove; Rev. Geo. W. Evans, Ocean Grove. A. E. Ballard, Clerk and Health Inspector, Ocean Grove.

In the earlier part of the winter there were eleven fully-developed cases of scarlet fever. Most of these were in the eastern part of the Grove, and where there has been comparatively little sewerage. Every case received the fullest sanitary attention, and the rules regarding sulphur fumigation were carried out. It is pleasant to record that no case had a fatal termination.

These were followed by five cases of diphtheria. Two of these were of a very aggravated type. The methods recommended by the State Board were followed in every case.

During the past year there has been a considerable advance in practical sanitation. The grade of the streets has been made to correspond more perfectly with the needs of the water-surface flow, so that it may more readily and rapidly reach the lakes and sea.

The regular water-supply from the artesian wells has met all the needs of the people, except for a short period in the summer, when a very great quantity was used for watering the streets. There is no diminution in the supply from the wells. Five new ones have been added during the year, making, altogether, thirteen. One hundred and seventy-nine connections of houses with the water system have been made since last annual report, making the whole number of houses connected 562. The surface wells are rapidly exhibiting signs of pollution. In cases where this is suspected, the water is sent to the chemist of the Boards of Ocean Grove and Asbury Park, and its use permitted or prohibited in accordance with the report of its analyzation.

The sewer system still works without difficulty Its deodorization in the sea does not interfere with the bathing stations above and below them. No perceptible odor or discoloration is discerned ten feet from the outlet. No main pipes have been choked, and but few of connecting ones from the houses. The catch-basins, principally hopper-closets, are being rapidly substituted for the vaults.

Wesley lake has this year given us some trouble. A settlement, mostly of colored people, upon its borders above Ocean Grove, has very largely emptied its filth into the little stream which supplies it. A restaurant is built over it, much of whose refuse finds the same outlet. This was arrested at the head of the lake and raised the level of its bed. The waters were so high in the early spring that it became necessary to lower the water, which exposed the bed of all the upper part to the rays of the sun. The work upon the bridges was immediately suspended, and will not be resumed until after cold weather, at which time the lake will be freed from the accumulations which interfere with its healthfulness. There will be a joint meeting of the Boards of Health of Asbury Park, Ocean Grove and the township in reference to the "settlement" and "restaurant." If nothing can be reached in that way, it will be necessary to indict as a nuisance.

Our garbage system remains as it was. It is collected daily in the hot weather (except Sundays) and tri-weekly or bi-weekly at other times. It is still taken away for nearly ten miles and ploughed under.

The rubbish of the place is carted over into the low swamp ground owned by the Association. In the autumn, such parts of it as will burn are consumed, and the rest remains to gradually fill up the grade.

As the importance of the matter is placed more and more before the people, there is a better attention to cleanliness of house and street. There has been no year, so far, in which the rules have been so well observed.

The underground cesspools have been greatly reduced in number and are rapidly diminishing. Complaints against them receive the fullest attention from the Board, and upon these complaints notices are issued for their abolishment and the substitution of the sewer system.

Electric lighting has been introduced all over the Grove. It has had the usual difficulties in getting into working order, but no one has been injured, and it now works satisfactorily both in quality and amount of light, and lessens greatly the danger from fire.

RARITAN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Thos. S. R Brown, Keyport; John W. Keough, Keyport; Asbury F. Walling, Keyport; A. F. Bedle, Assessor, Keyport.

RED BANK.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Robert Allen, Jr., President, Red Bank; John H. Cook, Secretary, Red Bank; Samuel Cullington, Red Bank; M. M. Drohan, Red Bank; Alfred Trafford, M D., Red Bank. James Norman, Health Inspector, Red Bank.

Red Bank, N. J., is situated on the south bank of the Shrewsbury or Navesink river, about forty feet above tide-water. The proximity to the ocean renders the climate more equable than it would otherwise be, though the saltness and moisture of the atmosphere are said by physicians to aggravate some diseases. The population is about 3,400.

The soil is sandy, into which the rainfall quickly soaks. Below the sand, which goes to a depth of from three to six feet, is a clayey loam, and below this is the marl stratum. The borough of Red Bank extends along the river and is a little over a mile long, following the river line, and about half a mile wide in its widest parts.

The water for domestic use is procured from ordinary wells, and from the public water system of the town. The well-water or surface-water is in some cases found to be hardly fit for use. The water for the public supply is procured from a large well, which was dug down through the marl until the water-bearing sand was reached. This water has been analyzed by Prof. Cook, the State Geologist, and has been found to be remarkably pure. The artesian wells of Asbury Park and Ocean Grove derive their supply from the same subterranean source which feeds the well at Red Bank. The demand for water from the public supply is constantly increasing, and it is probable that another well will be dug, or some other means adopted to increase the supply.

The town is destitute of sewers, except such as carry off the rainfall. The town is drained by these sewers, and also by a brook which runs through the back portion of the town. The land has a gradual slope toward the river and also toward this brook, and but comparatively little water is left on the surface of the ground to become stagnant. The cellars and basements of houses are dry, the drainage being such as to prevent the water from settling in the cellars.

The streets of Red Bank are very muddy at certain seasons, particularly in the spring. One of the main streets of the town has been macadamized, but this does not prevent the accumulation of mud.

Quite a number of the houses of the town have basements. These are, as a rule, as dry and comfortable as the upper rooms. Where there are cellars, and not basements, the cellars are used for storing vegetables, coal, &c. Very few of the houses are occupied by more than one family, and most of these are double houses, where the apartments and yards are wholly separated from each other.

Kerosene oil is used almost exclusively for lighting the houses of the town. Gas is used in a few houses and in a number of stores. Many of the stores are now lighted with incandescent electric lights, a plant having been introduced during the past year. The use of this illuminant is gradually finding its way into offices and private houses.

Much of the refuse of the houses is burned, and the Local Board of Health advises that this plan be pursued as far as practicable. There are no connections from houses with the sewers for the carrying away of excreta. Old-fashioned privies are used, some of which have cemented sides and bottoms, while others have not. When the vaults become full or nearly so, the contents are removed by means of air-tight suction hose and barrels or wagon-bodies. These latter are so constructed as to be air-tight, and so prevent any annoying or offensive odors.

The town has no "markets" aside from the grocery stores and butcher shops.

No record is kept of the diseases of animals. There has not been, so far as known, any epidemic of contagious or other diseases affecting animals here for the past year.

There are no slaughter-houses in the town.

There are no manufactories in the town, in the proper sense of the word. The nearest approach to manufactories are small shops, planing mills, printing offices, &c., where the sanitary conditions are as good as those of dwellings.

The schools of the town are of brick, well lighted and well ventilated, and are kept in a thoroughly good condition. When contagious diseases are found to exist in any family, none of the children of that family are permitted to attend the schools.

No alms-house, hospital, or other charitable institutions of a like kind are found in Red Bank.

The village jail is a small square brick structure, which is under the charge of the town authorities. It is whitewashed frequently, and the cells are kept in as good a sanitary condition as possible. It is seldom used as a place of detention for more than a few hours at a time.

Only one building in town is more than three stories in height. There are no outside fire-escapes attached to any of the buildings.

There are no cemeteries in Red Bank. The laws regulating burials are strictly enforced by all the cemeteries in this neighborhood, and the bodies of persons who have died from contagious diseases are not allowed to be forwarded by rail to places of interment. Public funerals of persons who die from contagious diseases are also prohibited.

The regulations of the Board of Health are similar to those of other towns of like size. A copy of the ordinances and regulations of the Board of Health is enclosed. The notices sent out by the Board of Health, since it was organized, have been obeyed in every instance but one. In that case the counsel for the Board doubted whether the Board had sufficient power to compel the changes to be made which were suggested by the Board. The responses to the notices have been in most cases very prompt, and only in a very few cases was there any delay in complying with the suggestions or demands of the Board. One of the most common annoyances in connection with this matter has been the number of anonymous complaints sent to the Board. In almost every case, these anonymous complaints, on investigation, proved to be without foundation, and a number of them, when traced to their authorship, were found to have originated in neighborly spite. The Board, finally, was compelled to adopt the rule of paying no attention to anonymous complaints.

Every marriage, birth and death occurring within the town of Red Bank is recorded in the books of the Board of Health. During the year ending October 1st, 1888, there were 58 deaths, 76 births and 49 marriages. Of the deaths, 47 were of white persons and 11 colored; 33 of the deaths were those of male persons and 25 those of female. There were 18 deaths of persons under 5 years of age, 5 deaths of persons between 5 and 20 years of age, 24 deaths of persons between the ages of 20 and 60, and 11 of persons over 60. The oldest person to die was a man aged 95 years.

Every case of contagious disease is quarantined. In most cases absolute isolation of the patient is maintained, except from those in attendance upon him or her. Each case of contagious disease is reported to the Board of Health by the attending physician as soon as he learns of its character. In most cases the quarantining of the patient and the use of disinfectants, &c., are attended to by the physician in charge of the case.

The sanitary expenses are met by the town. A certain sum is appropriated each year for the use of the Board of Health. In no case has this overrun the amount allotted by law (five cents per inhabitant), except during the first year of the organization of the Board, when a complete sanitary inspection was made of every place in town, the cost of which, together with the printing of the ordinances, &c., made the expenses considerably heavier than usual, that year.

Stoves are usually used as means of heating. Some few places are heated with hot air from heaters, and a still smaller number of places are heated with steam.

There have been no diseases specially prevalent.

(Signed) JOHN H. COOK,
Secretary of the Red Bank Board of Health.

SHREWSBURY TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jos. W. Child, Red Bank; Forman R. Smith, Fair Haven; Wm. T. Parker, Little Silver.

UPPER FREEHOLD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Joseph Holmes, Jr., Cream Ridge; Geo. H. Vanderbeek, Allentown; G. H. Worden, Allentown; Isaac S. Dawes, Imlaystown; H. G. Norton, M.D., Imlaystown.

There has been little sickness within the year and nothing worthy of special notice, except typhoid fever, which seems prevalent all over the township, but more especially in and near Imlaystown. There have been nineteen cases in the township; besides, I might mention that I have attended professionally eleven others just out of this township, over in Millstone, near Clarksburg, making a total of thirty cases known to me in a radius of ten miles. In some of the cases it is easy to see what might readily be the cause of the sickness, but in other cases we are unable to discover any cause. The cases in Imlaystown, where the fever has shown itself every summer for several years, are readily accounted for in the faulty, shallow wells and contaminated water, which your analysis has already proven to be unsafe for use. Our only remedy—efforts to persuade people to abandon them—has only availed in one instance, and so the fever continues. Some of the cases outside of the village, I believe, can be traced to infection while visiting families in the village, where the well-water is known to be impure, and where cases have occurred previously. We can find no other cause for the fever breaking out and running through a whole family, in one or two instances in isolated farm-houses, than the suppositien that some members of a family in Imlaystown, where the fever prevails, suffering from slight indisposition and diarrhœa (a walking case of typhoid), have visited the farm and remained some time, the fever breaking out that fall or the following summer. In some well-kept farm-houses, where there does not appear to be any unusual unsanitary conditions, there have been severe cases of typhoid this year.

There have been three cases of scarlet fever, which we cite as illustrating a possible source of contagion. A farmer's family have been in the habit of boarding, through the summer, about fifteen "fresh-air children," sent into the country by charitable societies in New York, the method being to return them in two weeks and get a "fresh" lot. It was the custom of a young lady in the family receiving these children to sort out, shake out and arrange the clothing of the children upon their arrival and pack it up for them on their return. On the seventh day after the arrival of fifteen children, the young lady whose duty it was to shake out the clothes for the children sickened and broke out with scarlet fever, of which she had a severe attack. One week later her two sisters sickened, but were not as sick as the first case. This scarlet fever was undoubtedly conveyed in the clothing of the children, as none of them were in any way sick during their stay. They had been examined by a physician before leaving New York.

(Signed) H. G. NORTON, M.D.,
Secretary.

WALL TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

James L. Allgor, New Bedford; Brannin Neubery, Manasquan; Henry Wainright, Manasquan; A. A. Higgins, M D., Manasquan; John M. Allen, New Bedford.

MORRIS COUNTY.

BOONTON.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. A. E. Carpenter, Dr. John G. Ryerson, Richard H. Richards, Wm. I. Powers, W. Ginble, John Manfield.

CHATHAM TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John M. Tunis, President, Madison; B. W. Burnett, Madison; E. P. Miller, Assessor, Chatham; Merrit Lum, Chatham. S. H. Reed, Secretary and Health Inspector, Madison.

The Board has done considerable work in abating nuisances.

Inspector's salary, $50.

We had an epidemic of scarlatina, traceable to influx of new residents on April 1st, and seeming to progress along a certain milk route. Dr. E. M. Hunt was called to inspect the dairy supplying said route, but, on chemical examination of milk, found no infection therein. The type of scarlatina was mild.

(Signed) S. H. Reed,
Secretary.

CHESTER.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

E. C. Drake, Chester; Theo. B. Wortman, Chester; John Kelsey, Chester; Reuben C. Carlile, Chester; W. H. Green, M.D., Chester.

The year ending October 1st, 1888, has been with us, as usual, very healthy. We have had no epidemics, and no one disease has prevailed to any great extent. We have had a few cases of scarlatina and a few of diphtheria, but, so far as I know, none have resulted fatally. There were but few cases of cholera infantum during the heated term, and the bowel troubles peculiar to the summer months yielded readily to the recognized mode of treatment. No diseases of domestic animals have been reported.

(Signed) W. H. Green, M.D.,
Physician and Secretary of the Board.

DOVER.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. T. R. Crittenden, President, Dover; Jas. W. Canell, Dover; Fred. H. Beach, Dover; John S. Gibson, Dover; J. J. Vreeland, Dover.

A new water system for the supply of the town was put in operation December 1st, 1887. The water is brought in pipes from 16 wells or springs, to a reservoir, and thence distributed through the town by mains. The surface drainage in the vicinity of these springs or wells is complete, and all the appointments are those of a perfect water system.

There have been isolated cases of diphtheria throughout the year, but they have been carefully looked after, and there has been no general epidemic. At the present time there are no cases of the disease.

(Signed) JOHN S. GIBSON,
Recorder of Vital Statistics.

JEFFERSON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jacob Tallman, Chairman, Oak Ridge; Albert J. Titman, Secretary, Woodport; Joseph W. Headley, Milton; Charles Jennings, Milton; Leonard Bright, Township Physician, Woodport.

Water-supply is from wells and springs. I think no cisterns are used. In some mountainous districts, in the vicinity of iron mines, families are supplied from the mines. The water is not discolored, but has an iron taste. It is hard. It is not bad at any season. Water-pipes are used in a few places to convey the water from springs. There is no sewage above point of supply other than, perhaps, surface-water from wood lots, &c., in rainy seasons. About an equal number depend on wells and springs.

Drainage is altogether natural, the surface being so irregular that sewers are not needed. Cellars are dry. There are some swamps, where malaria has been frequent, but very few cases are heard of lately.

Streets and roads are kept in good condition, with proper drainage for carrying off all water.

Houses generally have cellars, which are principally used for storage of vegetables. I think there are no houses having more than two families. There is a yearly inspection in the more thickly-settled parts of the township.

Mode of lighting is altogether by kerosene oil.

No sewers used.

No markets in the township.

No prevalent diseases.

No slaughter-houses.

No manufactories.

Schools are in good condition. Some of the school buildings are not what they should be, but most of them are in good condition and have the modern conveniences.

There are no alms-houses or hospitals.

There are no cemeteries other than the old-fashioned burying-grounds or church-yards, of which there are four in the township, and the dead are buried as the law requires.

There has been very little sickness in this township during the year, and no disease having been prevalent, the laws and regulations pertaining to health have not been called into use any more than to make inquiries in regard to the condition of the township.

Returns of vital statistics are all sent in that have been received. I know of a few births that have not been reported, and if I do not get returns in by the time thirty days expire, will inquire and report.

We have no plans for dealing with contagious diseases. Vaccination is not universal.

The sanitary expenses will not exceed $20 so far this year.

Houses are heated by stoves burning wood or coal. Ventilation is secured by dropping upper window-sash.

No diseases prevalent this year.

The reason that there is very little to report from this township is because it is very thinly populated—most of it a mountainous, wild district, dotted here and there with iron mines, and generally very healthy.

(Signed) ALBERT J. TITMAN,
Secretary.

HANOVER TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Joseph H. Bastedo, Assessor, Boonton; Wm. Bates, Parsippany; Marcus Dixon, Gray Hills; Isaac Clark, Morris Plains.

Water-supply is springs and wells, as it is a farming township.

There are four private slaughter-houses.

There has been no prevailing disease among stock.

There are four large paper mills in the township—one at Old Boonton, two at Monroe and one at Whippany.

There are no graded schools in the township.

The county alms-house is at Old Boonton; the Children's Home at Parsippany; the State Insane Asylum at Morris Plains.

The cemeteries are at Parsippany, Whippany and Hanover.

(Signed) J. H. BASTEDO.

MENDHAM TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John S. Stiger, M.D., Mendham; John D. Lindsley, Assessor, Mendham; E. C. Blaqure, Mendham; Jos Campbell, Mendham; Madison Connett, Brookside.

MONTVILLE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John H. Capstick, Montville; John Husk, Montville; Garret B. Jacobus, White Hall; Asa T. Cook, Assessor.

About 1,200 inhabitants.

The water-supply is from springs and wells.

Principally frame dwellings, occupied in general by one family only.

MORRIS TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Thos. H. Clifford, Morristown; John Denmar, Morristown; John W. Hays, Morristown; Wm. H. Mesler, Morristown.

In Morristown there is a private corporation known as the Morris Aqueduct. The town is supplied by this company with water. The water is taken from springs. Outside of the town, wells are used almost entirely.

We have no sewers. Cesspools are resorted to, in Morristown.

Lighting is by gas and electric light.

Cesspools are cleaned by private persons; swill is also collected and removed the same way.

There are no large markets.

Only small slaughter-houses and not much used.

Good public and private schools.

We have a police force of five persons.

There is a good fire department.

Morristown has a Board of Health, and there is very little for the township Board of Health to do, as nearly all the township is included in the city.

MOUNT OLIVE TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George A. Smith, President, Drakestown; Enos G. Budd, Recorder, Budd's Lake; Abram J. Drake, Stanhope; Nelson Salmon, Flanders; J. S. Farrow, M.D., Flanders.

Our report, according to the schedule, is the same as for 1885, 1886 and 1887. No epidemics of any kind.

(Signed) G. A. SMITH,
President.

PASSAIC TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Andrew Bird, Long Hill; I. F. Miller, New Vernon; F. Leo. Hendrickson, New Vernon; Oscar Lindsley, Assessor, Green Village.

Passaic township is largely agricultural. One small silk mill and one harrow factory on its southern border. Healthy; few deaths, and never any signs of epidemic of any sort.

(Signed) OSCAR LINDSLEY,
Assessor.

PEQUANNOCK TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

H. V. Day, M.D., Butler; Theo. F. Cox, Butler; Samuel De Mott, Pompton Plains; Richard T. Budd, Mountain View; Wm. H. Beam, Pompton Plains.

The health of our township is good. It is a healthy part of the county. No very filthy places in it. Everything that is unhealthy is promptly removed.

We had some malaria in the lower part of our township, because of some stagnant water, which we had removed by draining.

No slaughter-houses.

No nuisance of any kind.

No contagious diseases of horses or other animals.

Our factories are kept healthy by airing and careful management.

RANDOLPH TOWNSHIP.

There is no Township Board of Health; the Town Committee have never organized as such. The town of Dover has, and J. S. Gibson is Secretary.

(Signed) D. S. ALLEN,
Township Assessor.

ROCKAWAY TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Edmund D. Halsey, Rockaway; Edward Fox, Rockaway; Samuel T. Smith, Rockaway; E. B. Mott, Rockaway.

A few years ago, while Assessor of Rockaway township, I made two or three reports, which included about all the information that I could give at present, as no changes have been made, except the erection of the usual number of buildings—wood and brick.

(Signed) E. B. MOTT,
Assessor.

ROXBURY TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

R. C. Applegit, Chairman, Stanhope; Theo. F. King, Secretary, Drakesville; John A. Honnell, Assessor, Succasunna; J. L. Taylor, M.D., Succasunna.

The supply of water is from springs, wells and cisterns; principally soft water, without taste of iron.

There is no system of drainage or sewerage.

The cellars are dry, except a few instances in very rainy seasons.

There are no swamps that are known to produce malaria.

Houses have cellars in most cases; they are largely used for storage of vegetables. There are very few houses with even two families. There is no house inspection.

Have no cesspools or sewers.

There have been no prevalent diseases in the township during past year.

The Assessor is acquainted with loss of animals and contagious diseases, if any.

No slaughter-houses in township.

(Signed) **Theo. F. King**,
Secretary.

WASHINGTON TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

F. M. Stephens, German Valley; Dr. E. C Willet, German Valley; Philip Schuyler, Parker; Jacob Hann, Pleasant Grove; W. S. Swackhamer, Middle Valley.

There is no prevalent disease to be reported.

Other things as last report.

OCEAN COUNTY.

BERKLEY TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Thomas Harvey, Frank Wilsey, C. Lawrence, Henry Williams, Bayville.

Our township, as regards population, is small, and its location remarkably healthy.

Drainage naturally perfect, and as a general consequence free from most diseases. There have been a few cases of dysentery, caused by imprudence in eating fruits not fit to be eaten.

No slaughter-houses, and the cemeteries and school-houses are kept in proper condition.

No doctors in the township, and seldom are they required.

(Signed) **C. Lawrence**,
Chairman Township Committee.

BRICK TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

O. W. Budlong, M.D., Lakewood; I. V. Hall, Lakewood; J. L. Dorsett, West Point Pleasant; C. C. Pearce, Burrsville; H. E. Havens, Burrsville. B. H. Fielder, Jr., Health Inspector, Burrsville.

DOVER TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

R. B. Gowdey, Toms River; John Tilton, Silverton; James I. McKelvey, Toms River.

EAGLESWOOD TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Joseph P. Haywood, Chairman, West Creek; Samuel P. Cranmer, West Creek; John F. Jones, West Creek; Samuel Ashurst, M.D., Beach Haven; C. R. Cox, Sr., Assessor, West Creek.

Water-supply mostly from brick and stone wells with platform and pumps. Some use brook-water. Generally good water.

Drainage is by surface drains and underground pipes.

Cemeteries for burial purposes all on high land.

Health generally very good here.

Rather careless about vaccination.

JACKSON TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Conover Matthews, Secretary, Jackson's Mills; Joseph R. Brown, Cassville; John W. Jimison, Cassville; Joseph S. Clayton, Jackson's Mills.

In regard to the general health of Jackson township—it is thinly populated, and the health is generally good.

LACY TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Thomas C. Vanarsdale, Forked River; Garret Stout, Forked River; Frank Mathews, Forked River.

MANCHESTER TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Michael McCallion, Manchester; Wm. Montgomery, Manchester; Chas. Havelaniel, Manchester.

The water-supply is drawn from wells. The water is pure and soft, and is readily obtained.

There is no system of drainage. Houses, as a rule, are separate from each other. As the soil is sandy and light, it readily absorbs all such matter. The usual water-level is such as to secure dry cellars. There are more or less swamps in the township. It is not claimed that, as a rule, malaria results or arises from the swamps.

The houses generally have small cellars, and are used for the storage of family vegetables. Very few houses have two families, probably not more than 25.

Sewers are not used. Cesspools are not, as a rule, cemented; they are bricked up loose, or are holes dug in the ground and planked up. They are cleaned out when full, or necessary, with shovels.

We do not think the Assessor makes any inquiry as to diseases of animals.

We have no slaughter-houses.

No new manufactories.

While there were several cases of typhoid fever and malaria in different parts of the township during the past season, it was not claimed, by the attending physician, that they were caused by the bad sanitary condition of the natural surroundings. There are more or less cranberry bogs located in this township, which, during a part of the year, are covered with water; after the water is drawn off, it is claimed, by some persons, that the dead vegetable matter lying thereon produces an unhealthy state or condition in the atmosphere in the immediate neighborhood of the bogs; but as these bogs have been in existence for many years near the village, and the general health of the inhabitants has been good and free from complaint that would be likely to arise from such a condition, the complaints may be more imaginary than real. As the township extends over a large area of surface, and the greater portion of it is sparsely settled, it is hardly possible for me to answer your question fully, or in any definite form. The Township Committee have endeavored to perform their duty to the best of their ability.

(Signed) MICHAEL MCCALLION.

OCEAN TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Joseph Camburn, Waretown; Wyckoff Letts, Waretown; William Gray, Barnegat; J. H. Wilkins, Waretown.

The township is very small, and very healthy. Drainage is good. No malaria; no contagious diseases. Water-supply mostly driven wells; some open wells. There is no physician in the township.

PLUMSTEAD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Walter Cottrell, New Egypt; Edgar A. Horner, New Egypt; W. T. MacMillan, M D., Township Physician; Winfield Scott Choffey, New Egypt; Aaron S. Bronson, Assessor, New Egypt.

This township has been comparatively free from contagious diseases the past year.

Our Board of Health promptly remove any nuisance when reported and promptly attend to all business which belongs to them as a Board of Health.

(Signed) W. T. MacMillan, M.D.,
Medical Member of Board.

The village depends on wells generally; water soft and of good taste.

Cesspools open at bottom; contents are carted off by farmers and used on the land.

Slaughter-houses are kept in good condition.

(Signed) A. S. Bronson,
Assessor, New Egypt, Ocean county, N. J.

STAFFORD TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Edward E. Predmore, Manahawkin; John Letts, Manahawkin; Lewis A. Cranmer, Cedar Run; I. H. Cramer, Assessor, Cedar Run; P. K. Hilliard, M.D. Manahawkin.

The water-supply is almost exclusively from open wells or driven wells. The latter, however, are rapidly taking the place of open wells, and the water is generally drawn from a depth much below the other springs. The quality of the water throughout the township is apparently excellent, with the exception of a few surface wells. The water is clear, with no unpleasant taste, so far as I have been able to learn, except within a limited area of the low ground in the south-eastern part of the township, where the water used rises to within a few feet of the surface—two to eight feet.

No system of drainage has been adopted. Dry cellars may be constructed anywhere in the township, except in the area of low surface mentioned above. Swamps are numerous along the bay shore, but malaria is almost unknown in this section, unless contracted elsewhere.

Nearly all houses are constructed with cellars, and such cellars are largely used for the storage of the family supply of vegetables, &c., but the houses are built singly, and the ventilation is generally good.

But little attention is given to the subject of sinks and cesspools, and their proper construction. Most of them are mere depressions in the ground, and even if cemented the work is but imperfectly done, and when emptied at all, the contents are used as fertilizers.

The public health is good, and no special circumstances prejudicial to health are known to exist in the township.

(Signed) I. H. CRAMER,
Assessor.

UNION TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

L. G. Mitchell, Barnegat; Dr. Edmund Bennett, Barnegat; Wm. Cox, Barnegat; Joseph Pharo, Barnegat; John Predmore, Jr., Barnegat.

The location of our little township is so well and favorably known that it needs no comment. We have a population of about 1,300 inhabitants, and our death-roll is comparatively very light, resulting from pulmonary or lung diseases chiefly. This is owing presumably to our nearness to the sea and the consequent heavy atmosphere. There have been a very few cases of typhoid fever, two or three of which resulted fatally. Among our small list of deaths during the past year is the name of one who lived to the age of ninety-eight years, and we have a goodly number of life-residents of our township, who are yet enjoying fair health, between the ages of seventy and ninety years.

The topography of our township is quite varied, some parts being very high, making it difficult to obtain water at less than sixty or seventy feet. The supply is all derived from wells, both dug and driven to depths ranging from eight to sixty feet.

Our public school-house and grounds have been made the subject of complaint by some of our citizens, the same being located on rather low ground and being cramped for room. The difficulty has been remedied, however, by buying additional land and the filling in with gravel and draining of the lower portions. The principal remaining difficulty is in the ventilation and the drinking-water supplied to the children, which we intend to try to have remedied.

(Signed) LEWIS G. MITCHELL.

PASSAIC COUNTY.

ACQUACKANONK TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

J. H. Mercelus, Clifton; D. H. Schoonmaker, Richfield; W. C. Fredericks, Passaic Bridge; Peter J. Kipp, Assessor, Clifton; Dr. Ayres, Upper Montclair.

Population about 6,000. Location, mostly high ground. Climate moderate.

Bounded on the north by Paterson, on the east by Passaic river, on the west by Morris mountains, on the south by Essex county.

Water is supplied by wells, cisterns and springs.

Drainage is by natural courses; no sewerage.

There are no public grounds.

Houses are mostly frame.

The mode of lighting is by oil.

There are no markets.

Have heard of no diseases of animals.

The manufactories are, silk mill, varnish factory, paper mill and oil-cloth factory—one of each.

There are four public schools.

There is one Jewish cemetery.

Public health good.

Registration and vital statistics mailed to Trenton.

Dwellings are heated by stoves; ventilated by doors and windows

There are no prevalent diseases.

(Signed) P. J. KIPP.

LITTLE FALLS TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Squire Radcliffe, Little Falls; William H. Beattie, Little Falls; Joseph Sharp, Paterson. Mark Van Winkle, M.D., Health Inspector, Little Falls.

Location, Passaic valley. Ground rolling. Geology not known.

Water-supply from sunken wells; generally good.

Drainage moderately good—or rather, naturally good.

Streets nothing to boast of.

No public grounds.

Some tenements, many cottages; tenantry, mill operatives.

Refuse pretty generally thrown upon the highway. Excrement disposed of by the old-fashioned hole-in-ground method, called privy; often allowed to accumulate till it overflows for years.

Manufactories and trades consist of felt, hair, carpet, drugget, silk, dyeing, feed and flour mills.

Three public schools in township. Average attendance, fifty. Ventilation good. Location on elevated ground. Heated by stoves and basement heaters.

Health laws are not regarded fully.

Registration pretty generally attended to.

No quarantine. Contagious diseases are attended to at homes and residences.

Expenses for inspection and labor hired, $50. I have not received any compensation since my appointment, over two years ago.

Dwellings are heated by stoves or burners and basement heaters.

The prevalent diseases of the year were rheumatism, bronchitis, remittent and intermittent fevers.

MANCHESTER TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Albert S Beakes, Paterson; John W. Campbell, Paterson; Richard E Doremus, Paterson; S. Cyrus Townsend, M D, Paterson; Wm. D Berdan, Paterson.

Water-supply is from wells, springs and cisterns.

No sewers in the township and no other than natural drainage. Cellars are dry generally.

A tract of land in the village of Haledon, known as Cedar Cliff Park, containing about 100 acres, has been laid out in blocks and streets—or rather, a part of the park, say about forty acres, has been graded and quite a number of lots have been sold. Two large mills have been built; one of the mills is for weaving silk, the other one is for weaving upholstering goods. Some eight or ten dwelling-houses have been built and finished and several more are under way. Streets and public highways are in fair condition. We have about two miles of road macadamized, with fair prospect of having about as much more next spring.

Houses are built of stone, brick and wood, and are in good condition; mostly owned by occupants. There are some tenement-houses in the township.

Refuse is disposed of in various ways; mostly used as fertilizers.

No markets, except a few country stores.

No slaughter-houses and abattoirs in township.

There are five school-houses and five public schools in the township. In my district (No. 9) we have built and almost finished a very neat new school-house; size of building, 24 feet by 36 feet, two stories high. One church in township.

No alms-houses or hospitals in Manchester.

No protection against fire.

There are two cemeteries at the Goffle—one German and one Jewish; there are two at Totowa—one Roman Catholic, known as Holy Sepulchre, and a new one, called Laurel Grove Cemetery; all in Manchester township.

We have a code of laws for the health of inhabitants of township.

We are as careful as we can be in relation to the health of people of the township. Have had no contagious diseases nor any prevalent sickness in the township during the past year.

Dwellings are heated generally with stoves, &c.

No diseases have prevailed to any extent the past year in township.

(Signed) WILLIAM D. BERDAN,
Secretary.

PASSAIC.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. F. H. Riçe, President, Passaic; Joseph Adams, Secretary, Passaic; Dr. R. A. Terhune, Passaic; D. Demarest, Passaic; L. Aldouse, Passaic; M. King, Passaic. Wm. Hendry, Health Inspector, Passaic.

Location, high. Population, 10,000. Climate, temperate.

Water-supply very good; from Vreeland's lake; furnished by the Acquackanonk Water Company.

No sewerage. Surface-draining in the Passaic river and cesspools.

Macadamized streets. No public grounds.

Modes of lighting, gas and electric lights.

Refuse and excreta taken out of city and used by farmers.

Have five public schools, a number of private schools, and one public library.

Have a city poor-house, home and orphan asylum.

Have a police force and a city lock-up.

Have three steam fire engines, two hook and ladder trucks and one hose company. No fire-escapes.

There are two cemeteries in the city limits; one seldom used and one quite frequently. Burials in city not less than six feet deep.

Public health laws and regulations are regulated by city ordinances.

The Secretary of the Board of Health is Register of Vital Statistics, and reports are made according to law.

Quarantine exercised over contagious diseases. Small-pox cases quarantined, when they exist. All school children are vaccinated.

(Signed) JOSEPH ADAMS.

PATERSON.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Theodore Y. Kinney, M D., President; Charles N. Sterrett, James Mills, Frank E. Agnew, M.D.; Cyrus W. Baldwin, Registrar. John L. Leal, M.D., City Physician and Health Inspector.

Previous reports have covered nearly all the points enumerated in the schedule, and we have only to add the following:

About one mile of new sewers has been constructed since the last report. As rapidly as the sewers are built, houses are connected therewith, thus doing away with cesspools and vaults in that neighborhood.

Two parks, having a total area of thirty-two acres, have been purchased, and in time will be improved.

Market inspection has been provided by the Board. The Inspector has condemned large quantities of bad meat and decayed vegetables.

Three new school-houses have been built, having a total seating capacity of 1,800, yet the schools are all overcrowded.

The city jail has been rebuilt, and is now in good condition.

The method of placarding houses in which are cases of contagious disease, has been adopted as an experiment, hoping that isolation may be thus made more perfect.

Appropriation for fiscal year, $3,500.

Scarlet fever and diphtheria have been very prevalent during the year, as the following table will show :

	CASES.	DEATHS.
Scarlet fever	966	165
Diphtheria	238	72
Typhoid fever	43	21

These figures are for the year ending October 1st, 1888.

One case of small-pox was under treatment.

(Signed) JOHN J. WARREN.

POMPTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Martin Drew, Midvale; William C. Monks, Erskine; Daniel A. Wheeler, Erskine; Lemuel Van Ness, Pompton; Dr. R. B. Day, Butler.

The water-supply is from wells, springs and natural running streams.

Have no artificial drainage. Not much malaria.

Refuse and excreta are carted away once a year; quite often used as fertilizers upon the land.

(Signed) MARTIN DREW,
Chairman.

WAYNE TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Peter J. Doremus, Chairman, Paterson; David F. Duncan, Paterson; G. G. Jeffries, Mountain View; James D. Berdan, Paterson.

Water in the township of Wayne is obtained from wells or springs, mostly from wells, and is generally good.

There is no drainage except on low ground, which is ditched. The cellars are dry. There are no sewers.

No public grounds. The roads are worked by hire.

Nearly all houses have dry cellars, which are used for the storage of vegetables.

There are very few houses with more than two families; there is no house inspection.

We have no complaints on account of slaughter-houses.

There is one public burial-ground and several private ones.

We organize in the spring, and our township being unusually healthy, the committee do not think it necessary to appoint a physician and Health Inspector.

We keep a record of births, marriages and deaths.

There have been no prevalent diseases during the year.

(Signed) JAMES D. BERDAN,
Secretary.

WEST MILFORD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Oscar F. Smith, West Milford; Charles Oliver, Oak Ridge; Jos. Henion, Echo Lake.

Scarlet fever has been prevalent.

The rest of the schedule of subjects is same as has been reported in previous years.

SALEM COUNTY.

ALLOWAY TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Wm. E. Simkins, Alloway; Daniel P. Hitchner, Alloway; Daniel M. Hitchner, Cohansey; W. L. Ewens, M.D., Alloway; Chas. Johnson, Assessor, Alloway.

ELSINBORO TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Amos Harris, Salem; John G. Holme, Salem; A. Smith Reeves, Salem; J. W. Powell, Assessor, Salem.

No prevalent or contagious diseases; have had a few cases of typhoid and scarlet fevers.

LOWER ALLOWAYS CREEK TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. F. B. Harris, Canton; W. W. Patrick, Quinton; W. S. Smith, Hancock's Bridge; John M. Pancoast, Hancock's Bridge; Mark T. Hilliard, Hancock's Bridge.

The report stands about the same as last year, no disease being prevalent. There has been but very little sickness during the past year, with the exception of one case of typhoid fever, which resulted in death.

(Signed) MARK T. HILLIARD,
Assessor.

LOWER PENNS NECK TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Chas. W. Dunn, Salem; Wm. Newell, Pennsville; Chas. Lindsay, Salem; Obadiah Hurley, Pennsville; Hance Jaquette, Pennsville; James J. Moore, Pennsville; Edmund H. Lawrence, Pennsville; Elsworth Irelan, Pennsville.

Water-supply natural, by springs in the earth; at times hard, other times soft; generally bad in summer months.

Drainage, soil, generally; low in some places; water often in cellars. Swamps near. No malaria.

Sewers very few in this township; no account whatever.

Pretty nearly all houses have cellars, some of which are used for storage of vegetables. Two houses have three families each.

There is no yearly house-to-house inspection.

Sewers are not used. Cesspools have open bottom and sides; contents mostly remain one year before being removed, and are sometimes taken by the farmers and used for growing vegetables and grain.

No prevalent diseases so far. The Assessor inquires after animals and diseases.

We have no slaughter-houses in this township.

We have one tomato-canning factory in this township. No apparent evil results therefrom.

The population in this township is increasing very much. There have been very few deaths this year.

(Signed) CHAS. W. PALMER,
Assessor.

MANNINGTON TOWNSHIP.

NAME AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

David S. Fogg, Chairman, Salem; Wm. H. Acton, Secretary, Salem; Dr. W. C. Hinchman, Salem; Woodnutt Pettit, Salem.

The water-supply is mostly by wells and cisterns.

Cellars are mostly dry. Some few swamps in the township. Malaria prevails to no great extent.

Refuse and excreta are disposed of by farmers.

No disease prevailed to any great extent. One or two cases of disease in cows were reported in the spring, which were quarantined but did not prove contagious.

(Signed) WM. H. ACTON,
Secretary.

OLDMANS TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Asa G. Turner, Pedricktown; John S. Hampton, Pedricktown; Jacob J. Hunt, Auburn; W. Albert Justice, Pedricktown.

Water is obtained from wells almost invariably, although there are some who have springs on their farms, and prefer to make use of them.

Township health seems to have been rather above average during the past year.

(Signed) W. ALBERT JUSTICE,
Assessor.

PILESGROVE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles Richman, Sharpstown; John G. Borden, Woodstown; George B. Grier, Woodstown; Charles H. Richman, Assessor, Woodstown; P. G. Sowder, Physician, Woodstown.

Water-supply principally from wells and springs; good and soft, except in the neighborhood of deposits of marl.

Drainage by tile-drains, or natural drainage by porous subsoil. Cellars dry. But few swampy grounds.

Houses generally have cellars. In general, house-cellars are not used for the storage of vegetables.

No sewers used. But few, if any, cesspools. Common privies, without vaults; contents used for fertilizers.

No prevalent diseases among animals this year. No inquiry made as to loss of animals..

No inspection of slaughter-houses and no complaint made against them.

Have no manufactories and trades, except in a small way.

School buildings in good repair; schools well attended; no complaints known.

Have no alms-house.

Have no public cemeteries.

Have no special public health laws and regulations.

Dwellings heated by stoves, using coal or wood.

No prevalent or contagious diseases this year. The health of the township for the last year has been good.

But little, if any, hog cholera. No diseases among horned stock, except the loss of a lot of western cattle by one of our dealers, attributed to long confinement in cars and after-exposure to storms. No complaints made to the Board of Health.

(Signed) C. H. RICHMAN,
Assessor.

PITTSGROVE TOWNSHIP.

In response to your request, I will give you, as far as I can, a short account of the diphtheria cases here in our little town of 1,000 inhabitants.

The disease made its appearance about the 10th of October, 1887, in a family who lived in very close quarters near the mill-pond. The result was the death of two boys, aged ten and twelve, a daughter, aged thirteen, and one aged fifteen years. Another son, aged twenty, had a slight attack, which did not prove fatal. A baby of eleven months of age, who was in the house a part of the time, continued healthy. The sick ones were all on one floor, there being but two good rooms in the house, and they adjoining each other. Funerals were private. About three hundred yards from this house another family—mother and two children—was stricken; one child died. The same week there were three other cases, in different parts of the town, that seemed to have no connection with the previous ones. A young lady died in four days. Two children, in two other families, lived only a week from the time they were taken. A lady of forty, who did washing for a family with the disease, also had it, but recovered. Another case (fatal) was a child, two years of age, in a family of four; none of the rest took it. Out in the country, four miles from Elmer, four children out of five died. These cases all occurred inside of thirty-five days. There were doubtless other cases which I do not think of now. About the first of May, this year, a young lady of twenty, in one of the best families, died suddenly with it, and there were thirteen severe cases within thirty days, about one-half of them having proved fatal, one a young man of twenty. The funerals have mostly been private. There have been in both epidemics twenty-seven cases and seventeen deaths, as I now recollect them. There were doubtless other cases, which I do not think of.

(Signed) S. P. Foster,
Elmer, N. J.

QUINTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

C. T. Patrick, Clerk, Quinton; Chas. Walker, Quinton; John G. Fowser, Salem; Uz Ayars, Shiloh; Henry L. Davis. Quinton.

Water-supply from wells.

No system of drainage; soil so porous as not to need much drainage.

Most all houses have cellars; they are used by some farmers for storing potatoes, but the larger per cent. of farmers sell their produce in the fall, rather than store it.

State laws in regard to public health carried out.

(Signed) HENRY L. DAVIS.

SALEM.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William T. Hilliard, President, Salem; Josiah Wistar, Secretary, Salem; Thomas J. Craven, Salem; Simon B. Smith, Salem; Zacheus B. Sickler, Salem; C. M. Shenon, M.D., City Physician, Salem; S. Luther Richmond, City Recorder, Salem. William Carney, Health Inspector.

In presenting our report for the year ending October 31st, 1888, we regret being compelled to state that the general health of our city has not been so uniformly good as in some previous years.

Several cases of typhoid fever occurred during the autumn of last year, for some of which the supposed cause was ascertained to be a contaminated well of water, and a remedy was applied. In other cases, no satisfactory reasons could be assigned for the existence of the disease, except the general one, of an unusually wet season. Some cases of the same kind of fever occurred during the months of September and October of the present year, which could only be accounted for on the same general principles, the rainfall during those months being unusually heavy. Several alarming cases of diphtheria have occurred during the last few weeks, some of them resulting fatally in a short time, not yielding in the least to medical treatment. A thorough investigation of the premises where it proved most fatal, failed to reveal any cause whatever for such unusual mortality. (A chemical examination has since shown contamination of well by sewage.)

The water-supply continues the same as mentioned in previous reports, the drinking-water being very generally obtained from private wells, which are from ten to fifteen feet deep; the water from which, though not particularly pleasant to the taste, is believed to be wholesome. The water supplied from the public water-works, distant three and one-half miles from the city, continues to be of an unsatisfactory character for drinking and culinary purposes, except, perhaps, in the winter season. The remedies heretofore applied have not proved effective, and it would seem to be a necessity to sooner or later abandon the present source at Laurel Run, and seek some other supply.

The same difficulty of effectually draining our streets, as previously noted, still exists, owing to the surface, particularly in the central portions of the city, being flat. To remedy this in part, the Board of Health have employed a person, during the summer months, for the past few years, to flush and clean the gutters once or twice in each week, with very satisfactory results.

No general system of public sewers has as yet been adopted. One of the short ones, which in a former report was mentioned as having given us much trouble, after being relaid and its capacity increased, has proved very satisfactory and has occasioned no further complaint. As the public or city water is being more and more introduced into private dwellings, the necessity for some general system of public sewerage becomes more and more apparent, and, in the opinion of this Board, cannot safely be much longer delayed. The wells being shallow, there is constant danger of the water being more or less contaminated from the cesspools into which the pipes from water-closets empty.

Privies are mostly constructed without deep vaults, and care is taken to have them frequently emptied, that service being generally performed at night, by persons who make it their special business. One of our ordinances prohibits their being placed within fifty feet of a well of water, unless the vault is made water-tight by the use of cement.

Houses are almost uniformly built with cellars, which for the most part are dry, the only exception being in the lower portions of the city in times of excessively wet weather. More care is, perhaps, taken than formerly not to go to too great a depth in digging them.

Since we succeeded in having the slaughter-houses removed to a greater distance from the built-up portion of the city, and have exercised a care that they should be properly kept, we have had little or no trouble from that source. We are convinced the plan adopted is preferable to banishing them entirely from the city limits, as at one time proposed, as we are now able to have a supervision of them.

There have been no diseases of animals to note. The so-called hog cholera, which prevailed to such an extent two or three years ago, had the effect to diminish the number of swine kept by our citizens, which removes one source of trouble and annoyance, it being difficult to have their styes maintained in a cleanly condition.

Improved systems of heating and ventilating have been introduced into one of our public school buildings, which have proved very satisfactory, and it is believed all our school buildings' are reasonably well provided for in these respects. Much complaint is made of the insufficient ventilation of the court-room, and we hope it will early receive from the Board of Chosen Freeholders the attention which its importance demands.

In addition to the new public cemetery noticed in a former report, the Roman Catholics have purchased a site and laid out and consecrated a cemetery for their own use, which relieves a want long felt, the one heretofore used by them being quite too full to permit of any further interments without endangering the health of the neighborhood.

We continue to appreciate the advantages of the law allowing to such cities as ours the benefit of a Health Inspector, and the improvement in the sanitary condition of the houses and premises, since his appointment and inspections, has been quite marked. Having funds at our own disposal is another great improvement over the system of former years, when we were dependent upon the City Council for money to defray any expenditures we felt called upon to make in the interest of improved health.

The vital statistics have been accurately kept by the City Recorder as required by law.

In conclusion, we would say that, while conscious of our own shortcomings, we can but hope some good has been effected by our efforts, particularly in the way of convincing our citizens of the importance of a more strict observance of all sanitary measures and regulations, though we have abundant evidence there is much more to be done in this direction.

(Signed) JOSIAH WISTAR,
Secretary.

UPPER PENNS NECK TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Samuel C. Springer, Chairman, Pennsgrove; John M. Bevis, Pennsgrove; Dr. Dave Moore, Medical Member, Pennsgrove; Amos Morris, Assessor, Pennsgrove. S. P. Ward, Health Inspector, Pennsgrove.

Pennsgrove is located on the east bank of the Delaware river, opposite Wilmington, Delaware.

The supply of water is generally by wells.

The drainage is not first-class. The town is drained by ditches, &c.

Some of our houses have water in cellars during rainy seasons, although some have tile-drains.

Slaughter-houses are kept in good condition.

This year has been a very healthy one in this locality.

Pennsgrove has a graded school, with five teachers. There are four other school-houses in the township, all in first-class repair and working well.

No diseases prevailing here this year.

The Board of Health was called out to abate a hog-pen nuisance. The owner promptly removed it.

(Signed) A. MORRIS,
Assessor.

UPPER PITTSGROVE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jos. N. Gray, Secretary, Pittsgrove; Jacob H. Mead, Elmer; Benjamin Bassett, Pittsgrove; Albert L. Sturr, Monroeville; M. J. Paulding, Physician, Daretown.

Springs and wells are principally used for stock and drinking purposes. There is no general cause of pollution in a well that is in constant use.

The rolling character of the ground or land affords a perfect system of drainage, the springs and surface-water finding their level in the ponds used as water-power.

Houses generally have cellars. Vegetables on small farms are stored in the cellars. On the larger farms cellars are constructed separate from the dwellings, for storage of vegetables. There are no tenement-houses of more than two families.

Have no sewers. All manures and other matter of a fertilizing nature are drawn in wagons to the fields and plowed under.

No prevalent diseases among animals are reported this year. One case of fatality among swine was reported; not of cholera, however, but the name ascribed was "thumps," occurring in the months of October and November.

Have one slaughter-house, tidily managed.

Two canning-houses have been in operation within the limits of the township this year, and especial pains have been taken to abate any nuisance that may arise therefrom. These two tomato-canning factories form an important feature of the industries in the township, giving employment to a large percentage of the laboring people, both male and female.

This township has a record of births, deaths and marriages carefully kept, and returns are forwarded to Trenton.

Care over contagious diseases is regulated by State law. The family physician looks after all cases of vaccination.

The sanitary expenses amount to $10.

Wood from the surrounding country and coal from the mines of Pennsylvania are used for heating, and plenty of ventilation is obtained in the country.

There have not been ten cases of any disease this year, so the township physician reports. A few cases of diphtheria were attended with no fatal results.

SOMERSET COUNTY.

BEDMINSTER TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Ralph Davenport, Chairman, Pluckemin; John Auble, Secretary, Peapack; Erastus Randale, Bedminster; William Logan, Peapack; Edwin Farrow, M.D., Physician, Peapack.

The health of the people of this township has been excellent during the past year, and no complaint has been made to the Local Board. As I think this speaks well for the locality, I have nothing more to add.

(Signed) JOHN AUBLE,
Secretary.

BERNARDS TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. A. F. Voorhies, Baskingridge; John Compton, Liberty Corner; William Childs, Baskingridge; William Van Dorne, Baskingridge; J. E. Ballentine, Bernardsville.

The supply of water is from springs and open wells. The water is hard, owing to the limestone formation in this section. The water is pure, unpolluted and usually colorless except during periods of excessive rainfall, when it becomes more or less discolored by surface-water. But few families depend upon cisterns.

Generally speaking, cellars are dry and are kept clean and free from decomposing vegetables, and are properly ventilated.

The township is free from swamps and malarial miasm. Owing to the pure, salubrious mountain air, is is becoming more and more frequented each year as a health resort.

No systematic, yearly house-to-house inspection is practiced; the sanitary welfare of the laity being almost entirely entrusted to the care of the practicing physicians of the township.

No epidemic has prevailed during the year, except a mild epidemic, in the spring, of rötheln.

Slaughter-houses are conducted in such a manner that no complaint has been made during the year.

The Local Board of Health is not well organized. The few sporadic cases of contagious diseases that occur are not as carefully quarantined as the health and safety of the well demand. Parents are often neglectful in the matter of having their children vaccinated in early infant life. Physicians should consider it their duty to impress upon their patrons the importance of this; and also the advisability of revaccination at stated intervals, especially when an epidemic of small-pox occurs in the vicinity.

Fred. C. Sutphen, M.D., Liberty Corner, settled in the township during the current year.

BRANCHBURG TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Peter Dumont, Secretary; Theodore J. Starnar, North Branch; Wm. H. Doliver, South Branch; J. B. D. Myres, Readington, Hunterdon county.

We have no special report to make. The Board has not been called upon to act in any case during the year. There have been no epidemics, and people have been as healthy as usual.

(Signed) PETER DUMONT,
Secretary.

BRIDGEWATER TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. A. P. Hunt, Somerville; A. H. Brokaw, Somerville; O. P. Vosseller, Somerville; B. F. Little, Bound Brook; James Dahony, Raritan.

Some of our people are supplied with water from the Raritan river, near Somerville, and others from wells and cisterns. How many take from Raritan river, do not know.

Have no public sewers.

(Signed) O. P. VOSSELLER,
Secretary.

FRANKLIN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Peter W. Garretson, Weston; George Randolph, East Millstone; Joseph Christopher, East Millstone; P. Eugene Nevius, Assessor, East Millstone.

HILLSBOROUGH TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Henry S. Van Nuys, Chairman, Millstone; W. H. Merrell, M.D., Secretary; Peter Sutphen, Hillsboro; Jacob Nevius, Clover Hill; Adam Hummer, Millstone.

The Board organized May 31st. It has once been called upon. This was to abate a nuisance connected with a slaughter-house. The proprietor at once set to work to render his place inoffensive, when the need of so doing became apparent.

There has been no unusual sickness the past year, and nothing which it seems worth while to mention.

(Signed) W. H. MERRELL, M.D.,
Secretary.

MONTGOMERY TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Thomas Skillman, Chairman, Skillman; William Oppie, Secretary, Harlingen; Peter D. Staats, Griggstown; Cornelius B. Cruser, Plainville; Abm. B. Mosher, M.D., Griggstown.

The year just closed has been one of exceedingly good health. No epidemic has prevailed in our midst. The death-rate is very low; chiefly from old age and paralysis.

The entire township was visited during the months of June and July by me, and I am pleased to say I found no nuisances worth mentioning.

The three slaughter-houses we have are in good condition and are not considered any nuisance in the locality where they exist.

The water-supply is from wells, cisterns and springs, and is generally good.

Houses are mostly inhabitated by one family. Very few have basements. In regard to cellars, they are probably not as well drained as they should be; still, I think the people are taking more pains than formerly to have them so.

(Signed) WILLIAM OPPIE,
Secretary.

WARREN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Joel Codington, Secretary; Peter J. Zeglio, Physician; J. J. Lang, Robert Zergiebel, Peter Bowers.

The Township Board of Health did not meet this year.

The township is owned by men who use the land for farming purposes.

The condition of health is good, and the Board did not think it necessary to call any meeting.

(Signed) JOEL CODINGTON,
Secretary.

SUSSEX COUNTY.

ANDOVER TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles W. Roof, Chairman, Newton; George O. Young, Andover; Joseph P. Longcor, Andover; J. C. Clark, M.D., Andover.

Have no incorporated towns. Number of acres in the township, about 14,000.

Have no public nor private water companies. Wells, springs and cisterns afford supply for all domestic uses. Springs principally soft; wells, hard. Large portion of supply obtained from wells and springs; a few abandon their wells and use cistern-water.

No system of drainage. A good deal is being done in the way of open drains, clearing out obstructions from streams and under-drains, and reclaiming waste lands, by our farmers and other land-owners. Much more might be done with profit, both pecuniary and sanitary.

Houses generally have basements or cellars, largely used for winter storage of vegetables and fruit. Very few houses have more than two families.

No sewers. Cesspools generally laid up with stone, dry walls; occasionally one laid in lime and sand; open bottoms. When they become foul, build a new one, rather than clean the old one.

No prevalent nor contagious diseases among domestic animals.

No slaughter-house complaints.

Have one shoe manufactory; been running over two years, employing from fifty to one hundred hands; known as the Andover Shoe Company. The sanitary condition of the building is good; no complaints have been made for any neglect of duty on the part of the company in that respect. The building is well provided with fire extinguishers on every floor.

(Signed) G. C. Cook,
Assessor.

BYRAM TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Samuel T. Smith, Chairman, Waterloo; Daniel W. Goble, Andover; John D. Lawrence, Stanhope; David Stone, Andover; Dr. C. K. Davison, Stanhope.

Byram township is situated in the county of Sussex, and is bounded on the north by Andover, Green and Newton townships, on the east by Sparta township, and on the south by Lake Hopatcong and Morris county, the Musconetcong river being the line, and on the west by Warren county. The climate is healthy, having a varying thermometer range from sixty to ninety in summer, and from zero to sixty in winter. Number of square miles, about thirty-one. Number of the population at last census—1885—1,242. Water is pure.

Geological, topographical and general contour mountainous, with little valleys and small streams. The largest is Tubers run, emptying into the great basin of Lake Hopatcong and the Musconetcong river. The villages are Stanhope, bordering on the Musconetcong, and Waterloo, about two miles west of Stanhope, and bordering on the same. The Morris canal runs through both villages. The mountain rocks are mostly of gneiss, with occasional limestone. There is a boundless amount of the white limestone, which crops out in the northern part of the township, and many valuable veins of iron ore, with zinc also.

Lake Hopatcong is the largest body of water on the south, and dividing Sussex from Morris county. Stag pond is a beautiful sheet of water, in the north of the township, flowing about 100 acres. Roseville pond is another beautiful sheet of water, of about 100 acres, on the west, and the Cranbury, on the west, of about 200 acres, and the Bear pond, of about 200 acres, on the south. These two ponds are flowed by the Morris Canal Company for feeders, and one at Stanhope, of about 250 acres. The general water-supply is from springs and wells. All the water is impregnated with iron.

The drainage is natural and rapid; few swamps, and some little malaria occasionally.

Roads good, for mountain regions.

Houses mostly have cellars; very few basements; generally two stories; comfortable and homelike; mostly occupied by owners.

No disease of animals.

Slaughter-houses are kept clean and neat, and located away from the inhabitants.

Schools have been well attended, but the buildings need improvement; children healthy; no public vaccination.

There is but one old burying-ground, and none have been buried in that for a number of years. Of course some die, but they are buried in cemeteries out of the township.

Public health laws are generally observed.

Vital statistics are not very promptly returned.

Health of the township good.

Our Township Board of Health has its meetings at each meeting of the Township Committee, which saves trouble and expense. We have had but one complaint this year, and that was attended to.

FRANKFORD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Oscar Northrup, Augusta; Elias H. Roe, Augusta; J. C. Price, Branchville; George Phillips, Assessor.

Located near base of Blue mountain. Population, 1,500. Climate, rigorous.

Rolling ground; limestone and shale formation.

Water-supply from wells and springs.

The uneven surface affords good drainage. Have little sewerage.

Have but few streets and no public grounds.

Houses are occupied principally by owners.

Excreta deposited in vaults of loose, unmortared masonry.

School buildings are well ventilated; have good water-closets, and are distinct.

Have one alms-house, the sanitary condition of which is good.

The cemeteries are well regulated.

No violations of sanitary laws.

Registration and vital statistics laws are observed.

But little attention is given to vaccination; is disregarded by School Trustees.

Country houses are generally very well ventilated.

The prevalent disease of the year was pneumonia. The health has been unusually good.

In one or two instances only has the attention of the Board of Health been directed to conditions that could result in nuisances, and then a willingness to comply with the sanitary laws was manifested and the conditions complied with.

(Signed) George Phillips,
Assessor.

GREEN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Wm. C. Gray, Huntsville; George I. Lang, Tranquillity; J. A. Woolfe, Huntsville; Job J. Decker, Tranquillity.

Water-supply from streams, springs and wells.

Have a moderate amount of drainage.

Refuse and excreta are left in the barn-yards for manure.

Have had no contagious diseases among animals.

Have four school buildings—two of frame and two of brick.

Have two cemeteries.

Public health laws and regulations are all good.

No quarantine or vaccination.

Dwellings are heated by wood and coal; windows and doors for ventilation.

No prevalent diseases of the year.

HAMPTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Moses Ackerson, Halsey; A. O. Smith, Halsey; Theodore Harding, Newton; John S. Courson, Newton; Dr. McCloughan, Swartswood.

Water-supply from wells and springs, and, occasionally, from cisterns; quantity abundant; quality good.

Drainage is by open ditches and under-drains for low or meadow lands.

Houses are generally farm-houses; a few tenement-houses, occupied by one family.

The Assessor has not inquired this year, but thinks there have not been any contagious diseases.

No slaughter-houses in the township.

School-houses are in good shape; one room each, and heated by coal fires.

Have one cemetery, which is well cared for and in good shape.

No prevalent diseases of the year, to my knowledge.

HARDYSTON TOWNSHIP

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

W. H. Ingersoll, Hamburg; Edward Kincaid, Stockholm; Jesse Dennis, Assessor. One vacancy in the Board.

LAFAYETTE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

O. P. Armstrong, Lafayette; Sylvester Koyt, Lafayette; Isaac A. Simmons, Lafayette; Nelson Ackerson, Lafayette.

MONTAGUE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Joshua Cole, Brick House; Electus Shimer, Brick House; Sandford Nearfuss, Tri-States, New York.

The source of water-supply is wells and springs; the water is generally hard and of a limestone nature.

Houses mostly have cellars and are all used to store the winter supply of vegetables. There are no tenement-houses occupied by more than one family.

There is no known or prevalent disease in this town. There has been no loss of animals from contagious disease.

There is but one slaughter-house in the town. It is in a clean and healthy condition.

(Signed) **MATTHEW SHAY,**
Town Assessor.

NEWTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles S. Steele, Newton; Simeon S. Cook, Newton; Patrick O'Neil, Newton; George Hardin, Newton.

SANDYSTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Joseph Schooley, Layton; John Rosenkrans, Berans; Mark Sigler, Hainesville.

SPARTA TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William Strader, Elias Horton, James H. Steadworthy; T. H. Andress, M.D., Medical Member; John H. Crawford, Assessor.

The water-supply consists of wells and springs for drinking and cooking purposes, and cisterns for washing. Water in wells and springs generally hard, and considered very pure.

Surface drainage; the land is generally porous, gravelly soil. Very few swamps in the township, and those quite small.

Ogdensburg, a village in the north end of the township, near the zinc mines, used to complain of the existence of chills and fever a few years ago, but do not hear much about it lately; it was generally believed that the fresh material from the mines caused it.

Houses all have cellars; used for storing vegetables for family use.

Slaughter-houses are never inspected. There are three in the village of Sparta. In the summer time the smell in the neighborhood is very disagreeable, and there is considerable talk about it, and fault-finding. In the spring of 1888, scarlet fever broke out among the children, but the only deaths were two children in one family.

STILLWATER TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

W. E. Decker, Swartswood; Jesse Sherred, Swartswood; Geo. C. Huff, Middleville; Edwin Wintermute, Middleville; John S. Obdyke, Stillwater; C. V. Moore, Stillwater.

Water-supply from wells, springs and cisterns; on limestone, hard; on slate, soft.

There are some swamps, and some cases of malaria; not as much the past year as some others.

Most all houses have cellars, and some basements. The basements are occupied. The cellars are used for storage of vegetables.

No known or prevalent disease. The Assessor has inquired, but has not heard of any loss of animals from any contagious disease.

There have been no complaints made to the Board the past year.

(Signed) J. S. Obdyke.

VERNON TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Carlos Allen, M.D., Vernon; A. S. Blanchard, Assessor, Vernon; Stephen Wright, McAfee Valley; Nicholas Farber, Vernon; Lewis Martin, Glenwood.

The township of Vernon is located on the northeast corner of New Jersey, and is a rather mountainous district, with a valley running through the center of it and with a stream of water running through the same.

The water-supply is from wells and springs, and we find them both hard and soft.

As to drainage, there is but little of it done in this township. As a general thing, the cellars are dry. No swamps, to create malaria.

There are no prevalent diseases among animals.

No slaughter-houses in the township.

There are no manufactories to cause any evil to health.

The population in 1885 was 1,855.

There are ten school-houses, in good order.

(Signed) A. S. Blanchard,
Assessor.

WALPACK TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

J. W. Bunnell, Clerk, Walpack Centre; Philip S. Rosenkrans, Flatbrookville; John B. Fuller, Flatbrookville; Wm. T. Smith, Bevans.

The water-supply is chiefly from springs and wells; mostly hard water; very few cisterns.

As to drainage, there is no system. Cellars generally dry. Very little swampy land. No malaria.

Houses all have cellars, which are largely used to store vegetables. No house is occupied by more than one family.

No prevailing disease, the health of the people being uncommonly good, only two deaths having occurred in the last nine months. No disease among animals.

There is no slaughter-house in the township.

There is no resident physician in the township at the present time, Dr. Frank Beers having removed from Flatbrookville to Bushkill, Pennsylvania.

(Signed) J. W. BUNNELL.

WANTAGE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

N. Hall, Clerk, Deckertown; Jonathan Coykendall, Deckertown; S. M. Parcel, Deckertown; Warren Clark, Beemersville; Alex. Williamson, M.D., Physician, Deckertown.

The water-supply is almost entirely from wells and springs; a very few use cisterns. In this village (Deckertown) there are a number of bored wells, water being reached at a depth of twenty to ninety feet, the water soft, abundant flow and good quality. In my former report I spoke of the location of one well, and since that I have noticed a coating, yellowish-brown, on sides and bottom of vessels in which the water was kept.

There is no system of drainage. The water-level is such that all cellars are comparatively dry. Nearly one-fourth of the area of the township is swamp, but malaria, which has been prevalent in former years, is now hardly heard of.

Houses do not generally have basements, but all have cellars, which are largely used for storing vegetables of all kinds. I know of no houses of more than two families.

There has been no prevalent disease in the township this year. In one family there were four deaths from diphtheria, which was supposed to have originated from the well.

There have been no contagious diseases among animals; a few deaths have occurred from tuberculosis, but across the line, in Orange county, pleuro-pneumonia is now prevalent.

Slaughter-houses are cleaned and properly disinfected. Have heard but one complaint, and the cause was promptly abated.

Within the year a shoe factory has been started, that gives employment to about thirty operatives, the sanitary condition of which seems to be all that can be desired.

(Signed) N. HALL,
Assessor.

UNION COUNTY.

CLARK TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Wm. H. Enders, Chairman; Max Reifee, Lewis Smith; F. P. Bullman, Assessor; Dr. W. E. Cladek, Medical Member.

Water is obtained entirely from wells and cisterns; some wells furnish hard water and others soft, and all good throughout the year.

The drainage is mostly by natural means. Two branches of the Rahway river flow through the township. A few open ditches and a few underground drains afford all the means of drainage.

The houses are all frame, having cellars, which are used for the storage of fruits and vegetables. There are two large tenement-house rows, which accommodate about twenty families. There is no yearly house inspection.

(Signed) F. P. BULLMAN.

ELIZABETH.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John W. Whelan, President; Wm. M. Mack, M.D., 36 Third street; D. M. Miller, M.D., 1025 East Jersey street; John J. Donahue, 121 Marshall street; Wm. Birnie, Jr., 210 West Jersey street; E. L. P. Coleman, 319 Marshall street. E G. Putnam, Health Inspector, Sheridan House.

Water-supply from natural lake (Ursine); supplied by private company. Two thousand four hundred houses take water. Water seldom discolored; no iron or other taste; soft water; sometimes muddy, after storms. Pipes supposed to be cleaned regularly. No sewage above supply. Examinations made as to pollution. Quantity sufficient; quality fair.

Drainage is by surface gutters. Dry cellars in upper portion of city; in the lower portion many of the cellars are damp and some have water constantly in them. Malaria not very frequent, and confined to no certain locality. Sewers, brick; branch-pipes, fifteen or eighteen inches—fall, about one foot to one hundred; main sewers less; outflows, in Sound and Elizabeth river. Ventilation, perforated man-holes.

A large proportion of houses have cellars; some have basements, but not generally occupied. No yearly house-to-house inspection.

Sewers are used. Cesspools not generally cemented; mostly close wooden boxes; emptied by patent machine; removed to alms-house farm, outside city limits.

Glue-works, said to be evil to health, are to be removed. No other manufactories evil to health.

Have four public schools and one high school; another public school building in course of erection, to cost about $22,000, will be ready for occupancy in the spring. The ones now in use are heated by steam, with closets, in good order, outside. The building under construction will have the patent dry apparatus for use in the place of water-closets.

Have one alms-house, one general hospital, and several charities carried on by societies and private individuals.

Have three cemeteries—Evergreen, Mount Olivet and St. Mary's.

State public health laws adopted, and a Sanitary Code for the city adopted August, 1882.

Births, deaths and marriages are recorded. There has been reported to this office the following number of contagious diseases for the year: Diphtheria, 93; scarlet fever, 51; small-pox, 13; measles, 13; whooping-cough, 3; mumps, 1; chicken-pox, 8; croup, 2; typhoid fever, 9.

Quarantine strictly enforced. City Physician vaccinates indigent children free, and vaccination is enforced in public schools.

Sanitary expenses were $4,500.

A large proportion of dwellings are heated by stoves, some by steam, and the balance by furnaces. Ventilation depends upon chance.

FANWOOD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George Kyte, Scotch Plains; L. W. Miller, Scotch Plains; Wm. Terry, Plainfield; John Robson, Scotch Plains; F. W. Westcott, M.D., Scotch Plains.

Board of Health report questions same as answered last year. We have had a quiet year; only two complaints and these quickly corrected. Have had no epidemics, and in fact very little sickness. Very few cases of malaria.

(Signed) F. W. Westcott,
Secretary.

LINDEN BOROUGH.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Alex. R. Corbett, Linden; Ferd. Blancke, Linden; Edwd. Gulager, Linden; John A. Etheridge, Linden; M. Clay Lowdon, Linden; Victor Mravlag, M.D., Medical Adviser, Elizabeth.

Drinking-water entirely obtained from wells; water hard. All houses are supplied with cisterns, from which they obtain their supply of rain-water.

Our drainage is considered good. A few of the streets are laid with twelve-inch pipe connecting with a sewer (brick) emptying into West brook, a running stream the year round, whose outlet is the Rahway river. There are no low or swampy lands within the limits of the borough. Cellars usually dry, except during heavy storms, when some few of them have water in them, but upon the cessation of the storm the water runs off at once. Cesspools are generally used for sink drainage from kitchens, which are emptied every three months and carted away.

The excreta from privies are carried away in closely-boxed wagons made for that purpose, and used as fertilizers.

We have no contagious disease of animals. There are no diseases prevalent among the human family within the borough. Have not been troubled with malaria the past year. In fact, the residents of this section have been unusually healthy.

(Signed) M. C. Lowdon,
Health Inspector.

LINDEN TOWNSHIP.

During the past year the general health and condition of the township has been excellent. No epidemic has occurred. A few sporadic cases of scarlatina and diphtheria have taken place, and in every instance have been confined to their original locality. Quarantine and other measures for the protection of the people are strictly carried out in all such cases.

Malarial diseases have been very infrequent and mild.

Vaccination very generally performed.

Buildings (dwellings), as a rule, are well constructed, with cellars underneath.

(Signed) H. C. PIERSON, M.D.,
Roselle.

NEW PROVIDENCE TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John M. Badgley, New Providence; Samuel R. Valentine, New Providence; Maxwell F. Drake, Murray Hill. John W. Dickinson and A. M Cory, M.D., New Providence, Health Inspectors.

Water-supply is from wells and springs.

Drainage mostly natural.

Streets in fair condition. No public grounds.

Most of the houses are owned by their occupants, with only one family in each; they have cellars.

In the disposal of excreta and refuse, each one looks after his own interests.

There were no diseases of animals reported by the Assessor.

No manufactories.

There are three schools, all in good order; no public buildings.

No alms-houses or other charities.

There are three cemeteries in the township.

The health laws are strictly enforced.

Registration and vital statistics are properly attended to.

Our ordinances are sufficient, and the Board is ready to enforce them if necessity requires.

The officers so far have given their time gratuitously.

PLAINFIELD.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

George W. Rockfellow, President, Plainfield; Oliver B. Leonard, Secretary, Plainfield; Stephen A. Ginna, Plainfield; Lemuel W. Serrell, Plainfield; Charles H. Penfield, M.D, Plainfield.

To the State Board of Health:

GENTLEMEN—Within the past year this Board of Health has been fully organized under the State law, and by virtue of a city ordinance. The members proceeded at once to formulate a Sanitary Code, and held meetings every week for three months, to consider the matter. Six ordinances were adopted, embracing the following objects, which are designed to cover all necessary requirements: 1st, relating to marriages, births, deaths and burials; 2d, relating to contagious diseases; 3d, relating to food and drink; 4th, relating to nuisances; 5th, relating to kitchen garbage, swill and offal; 6th, relating to privies and cesspools. By-laws were also passed, and a competent Health Inspector appointed, who commenced at once a diligent inquiry and thorough investigation into the healthfulness of the city. He has made 724 inspections from house to house and yard to yard, and by his directions cesspools have been emptied and disinfected, and privy-vaults cleaned out, to the number of 204.

An ordinance was early adopted, regulating the proper disposal of garbage and swill. The householders generally have conformed to the system, and twice a week the refuse matter has been removed by regularly-licensed scavengers. There have been 260 orders issued for the abatement of nuisances, under this ordinance.

On account of these timely precautions and other needful remedies, there has been but little sickness of a preventable character. The general health of the city has been unusually good, and no epidemic has afflicted the inhabitants. Two or three cases of malignant diphtheria, brought into the place by strangers, were successfully managed by the Health Inspector and City Physician. Fumigation and thorough disinfection of the premises and destruction of bedding, &c., exposed to the contagion, prevented any additional harm.

The registration of vital statistics has been generally observed.

The establishment of a large cemetery (known as the "Hillside Cemetery"), just outside the corporate limits, will be a great benefit to the future healthfulness of the city. The number of interments in the five old grave-yards located in different wards, is decreasing every year.

The Board has not been called together for any especial trouble or complaint of nuisances. The thorough investigation of all premises within the older and more thickly-populated parts of the city, has resulted in the maintenance of cleanliness never obtained before.

(Signed) OLIVER B. LEONARD,
Secretary.

RAHWAY.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Dr. Elihu B. Silvers, President; H. B. Rollinson, Willet Denike, W. E. Cladek, M.D., John M. Tufts, Jr. Chas. H. Lambert, Health Inspector.

Our report, under general heads, is about the same as last year. The general health of the city has been good, with a large percentage of the deaths either among children under the age of one year or persons over sixty years of age. We have had some contagious diseases, including one case of small-pox, the patient being a child. The family was quarantined as soon as reported, and the nearest neighbors did not know that the disease was in their proximity until the house was placarded. We have also had cases of diphtheria and scarlatina, confined mostly to small children, and seeming to be of a mild form, with but few deaths.

The attention of our Board has been given, to some extent, to compel private property-owners to properly drain their lands, where private dwellings are erected. We have met with fair success, and have no doubt that in time a great benefit will be derived from said drainage. We have had a large number of nuisances reported during the year, which were, in most cases, abated without trouble; we have not had to take a single case into the police court up to the present time, December 5th, 1888.

(Signed) CHAS. H. LAMBERT,
Health Inspector.

SPRINGFIELD TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

J. J. Hoff, Springfield; H. M. Graves, Springfield; A. P. Carter, Springfield; Geo. Secor, Springfield. Dr. N. C. Jobs, Health Inspector, Springfield.

Water-supply from wells, cisterns and streams.

Cellars usually dry. Some are wet in spring of the year, owing to swampy ground.

SUMMIT TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Geo. Manley, Summit; Chas. Robbins, Summit; J. Pheasant, Summit; S. R. Mullen. Summit.

Our water-supply is entirely from wells.

There is no regular system of drainage; in most cases, however, cemented and ventilated cesspools are in use. Cesspools are emptied entirely by odorless sanitary wagons.

The township is well lighted by gasoline, which has given universal satisfaction. A system of electric lights is also in process of construction.

There have been no prevalent diseases during the past year; the health of the population has been exceptionally good.

Houses are generally provided with cellars, but as a rule are kept clean and dry.

(Signed) S. R. MULLEN.

UNION TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

James B. Woodruff, Roselle; John Leonard, Union; William A. Allen, Hilton, Essex county; D. Hobart Sayre, Union.

Our water-supply is derived from wells and running streams, and has this year been more than abundant.

But one complaint of nuisance has reached us, which the Board promptly acted on and abated.

Have had several notifications of contagious diseases, but no case that required action on our part, as the parties took all needful precaution and isolation.

Several cases of diphtheria have occurred, about one-half of which proved fatal. The disease was at four widely-separated points, in as many different school districts, and where the disease was contracted or what the cause was, is the mystery.

(Signed) D. HOBART SAYRE,
Secretary.

WESTFIELD.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Kilbourne Tompkins, Westfield; James L. Miller, Westfield; Joseph R. Connolly, Westfield; John McMaul, Assessor, Westfield.

WARREN COUNTY.

ALLAMUCHY TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Samuel G. Parks, Allamuchy; Samuel Drake, Allamuchy; William V. Axford, Allamuchy; John N. Hibler, Assessor, Allamuchy.

BELVIDERE BOROUGH.

Have at present no legal Board of Health.

(Signed) J. M. Snyder,
Town Clerk.

[Note.—This is an example of a town well located, but suffering in its reputation for healthfulness, by reason of defective health administration.—Secretary.]

BLAIRSTOWN.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John I. Blair, Blairstown; Samuel Linnaberry, Blairstown; Nathan S. Smith, Blairstown; R. B. Andress, Assessor, Blairstown.

FRANKLIN TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Charles Hazzard, Asbury; John Baylor, Broadway; William Pursel, New Village; Wm. M. Vliet, Assessor, Asbury.

FRELINGHUYSEN TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

L. J. Howell, Hope; Levi C. Howell. Johnsonsburg; J. W. Hart, Johnsonsburg; F. Rorbach, M D., Johnsonsburg; N. D. Vasbinder, Assessor, Johnsonsburg.

This township is supplied by running streams of fresh water, and springs and wells supply the people.

No sewerage. Low lands quite well drained by use of tiles. Nearly all cellars can be drained with proper care. No malaria.

Houses mostly have cellars; commonly used for the storage of vegetables. No inspection.

No contagious diseases among animals, except hog cholera. The loss in this town was very heavy last year, but very light this. But few farmers sustained losses this year.

No slaughter-houses in township.

No manufactories.

School-houses most all new or lately repaired. All well ventilated. No grounds for complaint.

GREENWICH TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William Sherrer, Secretary, Bloomsbury; William Shipman, Phillipsburg; R. K. Stone, Stewartsville; R. I. Smith, Bloomsbury; P. F. Hulshizer, M D., Stewartsville.

Have nothing to report in the way of any special disease in the past year. We have had only the diseases usually prevailing in all communities.

[NOTE.—A full account of an outbreak of pleuro-pneumonia was reported to the State Board, and proper steps were at once taken to prevent its spread.—SECRETARY.]

HACKETTSTOWN.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Thos. Nolan, Clerk, Hackettstown; Dr. J. S Cook, Hackettstown; Dr. Theo. Crane, Hackettstown; Dr. A. E. Martin, Hackettstown; Wm. M. Everitt, Hackettstown; Wm. F. Shields, Hackettstown; Chas. J. Reese, Hackettstown; C. N. Wade, Hackettstown.

Our water-supply is from a mountain spring rising on Schooley's mountain, and is brought to the town by iron pipes. It is soft water. The reservoir has been thoroughly cleaned and repaired this year. No discoloration from rains.

No sewerage, and the drainage is natural.

Streets are kept cleaned.

Nearly all the houses are two and a half stories, and rarely over two families in them.

The streets are lighted by electricity.

Most of the cesspools have open sides and bottoms.

Our markets are kept clean.

No diseases of animals.

Slaughter-houses are kept clean, and no complaints have been made against them.

We have one silk mill running, and it is in good condition.

The public school is well ventilated, and the scholars are healthy. Also, the seminary is in good condition.

Have no charitable institutions in the corporation.

Only one policeman and a small jail.

There are no fire-escapes except on the seminary.

The cemetery is well cared for.

The general public health is good.

There have been no prevalent diseases this year.

(Signed) THOMAS NOLAN,
Clerk.

HARMONY TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Roderic Vannatta, Roxbury; James W. De Witt, Harmony; Robert Kinney, Harmony; Asa K. Cole, Montana; J. D. De Witt, M.D., Harmony.

The Board of Health has not been called together during the year to act upon any complaint. There was an epidemic of diphtheria during the month of October, resulting in three deaths, two occurring in one family. The general health of the township during the year has been good, although several deaths have been reported.

(Signed) J. D. DE WITT, M.D.

HARDWICK TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Isaac S. Vass, Chairman, Marksboro; David R. Newman, Blairstown; Hiram France, Blairstown; Marcus C. Hill, Assessor, Blairstown.

The blanks sent me in October were not filled up, because there is no Local Board of Health in this township, acting as such.

There have not been any contagious or prevalent diseases during the past year.

(Signed) MARCUS C. HILL,
Blairstown, Assessor for Hardwick Township.

HOPE TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Edgar C. Howell, Chairman, Hope; Dr. Miller, Township Physician and Secretary, Hope; Geo. Dupue, Mount Hermon; James Fleming, Danville; John R. Hartung, Assessor, Delaware Station. Dr. Miller was elected to fill the unexpired term of Dr. A. L. Gibbs.

INDEPENDENCE TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Aaron B. Leigh, Danville; W. J. Barker, Vienna; Andrew Seimanton, Vienna; John Merrell, Assesser.

Most houses are built with cellars, which are largely used in winter for storing vegetables.

Very few houses have more than one family, to the best of my knowledge. There is no house inspection.

There has been no prevalent disease or epidemic during the year.

KNOWLTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Lewis C. Weller, Clerk, Columbia; Samuel Bogart, Delaware Station; William B. Moore, Columbia; Jeremiah Hiles, Knowlton; Ephraim Dietrich, Columbia; Robert Bond, M.D., Knowlton.

Water is supplied mostly from wells and cisterns, but there are some of the inhabitants who use springs. The water is both hard and soft, depending upon the situation; most of the well-water is hard.

There is no system of drainage used here; it is all natural drainage. There are quite a number of swamps, but not as much malaria as formerly.

There are no streets or public grounds.

The houses generally have cellars, which are largely used for the storage of vegetables. There are no tenement-houses containing two families, and there is no inspection.

Most of the cesspools are built with open sides, and the contents are emptied upon the land.

There are no markets.

The cholera has been epidemic among swine in this and adjoining township for the last year, causing a great loss among the pork-raisers. I do not know whether the Assessor makes inquiries into the losses of animals or not, but I presume he does.

There are no slaughter-houses in the township.

There are no manufactories in this township from which evil to health could result.

The school-houses are generally in good condition, although some are really too small for the number of scholars.

There are no alms-houses, hospitals or charities in this township.

No police or prisons.

No fire-guards or escapes.

There are four cemeteries in this township, all in good condition and well attended to. I know of no opportunity for them to affect the health of the community at the present time.

All laws and regulations for the benefit of the health of the community are well observed in this township. All particular or special matters are attended to at once by the Local Board.

The law in relation to registration and vital statistics is complied with.

There have been no contagious diseases in this township for the last year needing the interference of the Board, but I think that there are a great many in the township who are neglecting vaccination. It may cause trouble sometime, unless attended to.

There are no sanitary expenses.

Dwellings are generally heated by stoves. Ventilation good.

There has been no prevalent disease in this township in the last year, but in the neighboring townships of Hope and Frelinghuysen there has been a considerable epidemic of putrid sore throat.

(Signed) ROBERT BOND, M.D.

LOPATCONG TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jeremiah Yeisley, Secretary, Phillipsburg; Edwin H. Paulus, Phillipsburg; Robert D. Melroy, Phillipsburg; George G. De Witt, Phillipsburg; L. D. Bieber, Physician, Phillipsburg.

There is no change in the description of the township as regards drainage, &c.

The Board have been called in but one instance only, on account of burying carcasses of dead animals by the side of running water which is used for domestic and other purposes. The case was immediately attended to, and, I think, was a case of thoughtlessness on the part of the violator of the law. The general health of the township is good. There have been no prevalent diseases. I think there was one case of typhoid, and that did not result fatally. There have been no diseases among cattle, and, as a whole, the health condition in the township has been all that could be expected under any circumstances.

(Signed) JEREMIAH YEISLEY,
Secretary.

MANSFIELD TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

E. S. Apgar, Stephensburg; Nicholas Martenis, Karrville; Robert M. Thomas, Port Murray; James Beaty.

OXFORD TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John H. Lommason, Belvidere; John S. Banghart, Buttzville; Geo. A. Wildrick, Oxford; Michael Mountain, Oxford; L. B. Hoagland, Oxford.

Diphtheria has been prevalent in our township during the year, there having been in all about 75 cases, with, perhaps, 15 deaths.

Six or seven years ago we had a similar epidemic, starting in the same vicinity, probably due to damp cellars and personal filth.

Have had a number of cases of pneumonia in children, with meningitis as a sequel. There were a number of deaths from this cause.

(Signed) L. B. HOAGLAND, M.D.,
Secretary.

PHILLIPSBURG.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Chas. McClary, President, Phillipsburg; ——— Brakely, Clerk, Phillipsburg, Dr. Jacoby, Phillipsburg; George Flemmings, Phillipsburg; Isaac Miller, Phillipsburg; Jerome Durling, Phillipsburg; B. Frame, Phillipsburg. S. B. Burwell, Health Inspector, Phillipsburg.

There is an abundant supply of spring-water.

Drainage and sewerage are poor—of no account.

Refuse, garbage, &c., are placed on public dumping-grounds by each one doing his own hauling; no special management.

Slaughter-houses are in good condition.

Public school-houses are provided with fire-escapes; none others in the town.

Public health laws and regulations are not observed as they should be by the inhabitants.

PAHAQUARRY TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

William O. Vancampin, Daniel M. Depue, Ambrose Vancampin; Jason K. Hill, Assessor.

POHATCONG TOWNSHIP.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Jacob O. Boyer, Secretary, Finesville; David Frace, Shimers; Isaac Case, Warren Paper Mills; Nathan Case, M.D., Reigelsville; A. C. Albright, M.D., Springtown.

Water is obtained from springs, wells and cisterns.

No drainage, except natural.

There has been no disease among animals.

Only one slaughter-house.

Manufactories consist of one paper mill and three grist mills. There are five stores.

Public health cared for by Local Board of Health.

Some diphtheria, typhoid fever and malaria this year.

WASHINGTON BOROUGH.

NAMES AND POST OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

John Cushing, Secretary, Washington; Wm. M. Stiles, M.D., Washington; George Campbell, Washington; John Hornbaker, Washington; Levi Bowlby, Washington; George Dawes, Washington. Frank P. McKinstry, M.D., Health Inspector, Washington.

The source of our water-supply was quite fully treated of in the last report. As the water is gathered from two mountain streams which take their origin in springs not far above, there is but little danger of sewage contamination. There are no wells in use in town, but probably one-half of the houses are supplied by cisterns.

There is no system either of drainage or sewerage. The water-level in some localities is so near the surface as to insure damp cellars.

The tenement-house evil is one with which we are not afflicted. There is no system of house-to-house inspection. Inspections are ordered only upon complaint being made to the Board in a proper manner.

Cesspools are usually built with open bottoms and but seldom emptied.

Slaughter-houses are not inspected unless complaint is made to the Board.

There has been no special prevalence of sickness during the past year.

(Signed) F. P. McKinstry, M.D.,
Inspector.

WASHINGTON TOWNSHIP.

NAMES AND POST-OFFICE ADDRESS OF MEMBERS AND HEALTH INSPECTOR.

Wm. Miller, Secretary, New Hampton; Frank Tinsman, Washington; Jacob Castner, Changewater; ——— Gibson, Port Colden; Thomas Martin, Washington.

Washington township is situated in the southeasterly portion of Warren county. It contains but two small towns, except borough of Washington, it being a farming district.

The water-supply is from wells, springs and cisterns, mostly the latter.

The houses are comfortable wooden structures, with cellars; very few, if any, basement kitchens.

Kerosene lamps are mostly used as a light.

This year the animals have been unusually free from disease.

There are no manufactories and but very few with trades. Almost all depend upon the produce of soil for their living.

The school-houses are neat, comfortable, well lighted and heated, and equal, if not better, than any in surrounding country.

The past year has been comparatively healthy, having had but one slight epidemic of diphtheria in northern part, with few deaths.

We have at present no Health Inspector. Owing to the healthy condition of our township it has not been considered necessary by the Board.

(Signed) WILLIAM MILLER,
Secretary.

HEALTH LAWS AND CIRCULARS.

HEALTH LAWS.

A reference to legal opinions will be found on pages 52–55 and page 212 of this report.

A list of all former laws to 1888 relating to health is given in Circular LX. of this Board.

The following is a list of the laws relating to public health as enacted by the Legislature of 1888:

LAWS OF 1888.

Chapter XIII.—A Further Supplement to an act entitled "An act to provide for drainage and sewage in densely-populated townships in which there is a public water-supply," approved March fourth, one thousand eight hundred and eighty-four.

Chapter XIX.—An Act concerning the construction, care and improvement of the public ways, parks and sewers in certain of the cities of this state, and assessments for the same.

Chapter XXXIX.—An Act to secure in this state the certification of marriages, births and deaths, and of the vital facts relating thereto, and to provide for the record thereof.

Chapter XLIX.—A Supplement to an act entitled "An act providing for sewerage in and by adjoining cities, towns and townships," approved April twenty-first, one thousand eight hundred and eighty-seven.

Chapter LVI.—A Supplement to an act entitled "An act to establish in this state boards of health and a bureau of vital statistics, and to define their respective powers and duties," approved March thirty-first, one thousand eight hundred and eighty-seven.

Chapter LXXI.—Supplement to an act entitled "An act to establish in this state boards of health and a bureau of vital statistics, and to define their respective powers and duties."

Chapter CV.—An Act in relation to practicing physicians.

Chapter CXXII.—A Supplement to an act entitled "An act respecting the cutting of ice in cities of this state, and giving to boards of health in such cities power to regulate and control the same," approved March eighteenth, one thousand eight hundred and eighty-five.

Chapter CXXXV.—A Supplement to an act entitled "An act for the construction, maintenance and operation of water-works, for the purpose of supplying cities, towns and villages of this state with water," approved April twenty-first, one thousand eight hundred and seventy-six.

Chapter CXXXIX.—A Further Supplement to an act entitled "An act to provide for drainage and sewage in densely-populated townships in which there is a public water-supply," approved the fourth day of March, anno domini one thousand eight hundred and eighty-four.

Chapter CXLIV.—An Act respecting the confinement of persons under the age of sixteen years detained in the jails, work-houses, penitentiaries and other places of confinement in the several counties of this state.

Chapter CXLIX.—Supplement to an act entitled "An act to provide for the better security of life and limb in cases of fire in hotels and other buildings," approved March seventeenth, one thousand eight hundred and eighty-two.

Chapter CLXIV.—A Further Supplement to an act entitled "An act to provide for the drainage of lands," approved March eighth, in the year of our Lord one thousand eight hundred and seventy-one.

Chapter CCI.—A Supplement to an act entitled "An act to enable cities to build main sewers in certain districts, and to acquire private lands for that purpose," passed March twenty-fourth, one thousand eight hundred and eighty-five.

Chapter CCL.—An Act to authorize any of the municipal corporations of this state to contract for a supply, or a further or other supply of water therefor.

Chapter CCLX.—A Supplement to an act entitled "An act to enable cities to build main sewers in certain districts, and to acquire private lands for that purpose," passed March twenty-fourth, one thousand eight hundred and eighty-five.

Chapter CCLXXXIX.—An Act to authorize incorporated towns to construct sewers and drains, and to provide for the payment of the cost thereof.

CIRCULARS.

The lists of all former circulars issued by this Board are to be found in the sixth and eleventh reports. All circulars have been printed in some one of the reports, except Circular LX. in regard to the laws, which has been omitted on account of its length and is sent on request.

The following circulars have been issued this year:

CIRCULAR LXV.

OF THE

NEW JERSEY STATE BOARD OF HEALTH.

CONSTRUCTION, PLUMBING, VENTILATION AND DRAINAGE OF BUILDINGS AND OUTSIDE CONNECTIONS THEREOF, AS REGULATED BY LOCAL BOARDS OF HEALTH.

(The last Legislature passed the Plumbing law. Chapter LVI., Laws of 1888. See, also, last report.)

Ordinances relating to this can be passed by all Boards of Health, except those of townships. The law goes into operation July 4th,

1888. In its sanitary bearing it is one of the most important laws ever passed in this State. All health authorities recognize the house as the sanitary center and all else imperfect until its sanitary condition is secured. Clear up surroundings and remove nuisances as we may, we do not succeed until there is such sanitary control of the house as secures good drainage, the proper removal of refuse and such delivery of all liquids to be removed through pipes as prevents foul air and hidden deposits. Hence it is that London and other English cities make right construction of dwellings and proper housing of the people the advance idea in sanitary progress. Hence it is that New York, Chicago, Boston and Philadelphia are so much considering this subject. So, it is wise that this State acts instead of talks, and has put it in the power of every town and city to exercise this sanitary control.

In order that there might be some uniformity of direction and action, so soon as the law was passed the Secretary of the State Board called a conference of a few health officers and plumbers of the State, at Trenton. The chief design was to agree upon what regulations were feasible to be required by our City Boards and to secure uniformity as far as practicable. At this, and a subsequent meeting at Newark, there were present D. L. Wallace, M.D., Health Officer, of Newark; E. Dunn, plumber, of Newark; H. R. Baldwin, M.D., President of Board of Health of New Brunswick; Mr. Hammond, plumber, of Camden; Wm. K. Newton, M.D., Health Officer, of Paterson; J. T. Anderson, plumber, of Trenton; E. G. Harrison, C.E., Asbury Park, and various other gentlemen. Consultation was had on special points with acknowledged authorities, and various regulations, forms and specifications used in other cities were compared.

As a result, we recommend the following regulations as wise for adoption and as fitted to form the basis with plans and specifications for the various cities:

MODEL FOR CITIES FOR ORDINANCES TO CONFORM TO THE LAW (CHAPTER LXV., LAWS OF 1888).

Supplement to the Code of the ———— of the city of ————, regulating the plumbing and drainage of buildings.

Be it ordained by the Board of Health of the city of ———— as follows:

Section 1. Every person engaged in the business of a master and foreman plumber in the city of ———— shall appear in person at the office of the Board of Health and register his name, residence and place of business (blank forms to be furnished for this purpose), and in case of removal to make change in said register accordingly.

Sec. 2. Before any portion of the plumbing and drainage system of any building shall be constructed, there shall be filed in the office of the Board of Health a plan thereof, signed by the owner, showing the said plumbing and drainage system entire, from its connection with the sewer, cesspool or vault throughout the entire building, together with the location of all fixtures, traps, ventilating-pipes, &c. Said plan must be approved and the name of the plumber attached thereto before any portion of the work shall be executed. Before any changes are made in the direction of pipes or location of fixtures they must first be approved, and said changes made on the original plan on file. This regulation also applies to any extensions or alterations of existing systems, with the addition that in such cases a plan of the old system, as well as a plan of the proposed changes, must be filed in the office of the Board of Health. Drawings and descriptions of the plumbing and drainage of buildings erected prior to the passage of this regulation may be placed on file in the office of the Board.

Sec. 3. When the plan of any plumbing and drainage system is filed in the office of the Board of Health a fee of two dollars will be charged to defray the expenses of inspecting the plans, of filing and superintending the testing of the work, as provided in Section 40.

Sec. 4. The Health Officer shall be notified promptly by the plumber when the plumbing and drainage work of any building, or any portion thereof is completed and ready for inspection and testing. All inspections and testings shall be made as soon as possible after such notification. Any such system put in and covered without due notice to the Health Officer must be uncovered for examination at the direction of said officer.

Sec. 5. No building or premises will be allowed to be connected with any sewer, cesspool or vault without a permit first obtained from the Board of Health; and it is further required that permits shall be kept on hand during the progress of the work to which they relate, and that they shall be exhibited whenever required by the proper officers of the Board. The condition of this permit must be strictly complied with. This regulation applies to all sewers, whether on private property or in public streets or alleys. Before laying the drain from the building to the sewer, cesspool or vault, and after the trench is graded, the bottom of the trench must be carefully rammed, to avoid unequal settling of the drain. After the pipe is laid, as the trench is filled, the earth must be tightly rammed as near as possible to its original compactness. Tunneling is prohibited.

Sec. 6. When the ground is made or filled in, the drain extending from the sewer, cesspool or vault to the foundation wall must be of extra-heavy cast-iron pipe, of such diameter as may be approved. Such pipes should be laid with the joints properly caulked with lead.

Sec. 7. Where the soil consists of a natural bed of loam, sand or rock, the drain may be of hard, salt-glazed and cylindrical earthenware pipe, laid on a smooth bottom, free from all projections of rock. Each section must be wetted before applying the cement, and the space between each hub and the small end of the next section must be completely and uniformly filled with the best hydraulic cement. Care must be taken to prevent any cement being forced into the drain to become an obstruction. No tempered-up cement shall be used. A straight-edge must be used inside the pipe, and the different sections must be laid in perfect line on the bottom and sides.

Sec. 8. Where a building is to be connected with a sewer, cesspool or vault it must be connected by a drain not less than four inches in diameter, having a fall of not less than one-quarter of an inch to the foot. Old drains can be used for new houses only when found by an Inspector of this Board to conform in all respects to the foregoing regulations governing new drains.

Sec. 9. Where there is no sewer in the street on which a building faces, and it is necessary to construct a private sewer to connect with a sewer on an adjacent street or avenue, it must be laid outside of the curb, under the roadway of the street, and not through yards or under houses, without a special permit from the Board of Health.

Sec. 10. Pipe sewers must not be cut; house-drain connections with pipe sewers must be made with Y branches. Where connection is made with brick sewers, a terra-cotta junction-block must be used.

Sec. 11. All horizontal drains within and to a distance of six feet beyond the walls of buildings shall be of cast iron, with caulked, leaden joints, or wrought-iron screwed joints, and shall be so located as to be readily accessible for inspection. The house drain within buildings shall be securely hung on the cellar wall or properly suspended from the cellar ceiling, unless this is impracticable, in which case it must be laid in a trench cut at a uniform grade, the bottom of which must be covered with hydraulic concrete, and walled upon the sides with brick laid in hydraulic cement; said trench must also be provided with movable covers. The house drain shall have a fall of at least one-quarter inch to the foot, and more if possible. When a pipe passes under the wall of a building there shall be a relieving arch, to prevent the pipe being broken by settling of the foundation. Said drains shall be provided with openings for cleansing purposes, the same to be closed by screw plugs.

Sec. 12. A running or one-half S trap must be placed on the house drain at an accessible point near the house-wall. This trap must be furnished with a hand-hole for convenience in cleansing, the cover of which must be properly fitted, and made gas and air-tight with some suitable cement, properly applied.

Sec. 13. Every house drain shall have an inlet for fresh air, not less than four inches in diameter, entering on the house side of the trap and leading to the outer air, opening at some place shown on the approved plans, not less than ten feet from the nearest window. No cold-air box for a furnace shall be so placed that it can by any possibility draw air from this inlet pipe.

Sec. 14. All cast or wrought-iron pipes must be sound, free from holes, and when laid under ground shall have a uniform thickness of one-quarter of an inch; when placed above ground said pipes shall have a uniform thickness of one-eighth of an inch. Where the building is over sixty feet high above the curb, pipes of the following weights shall be used, with extra-heavy fittings:

2-inch, 5½ pounds per lineal foot.
3-inch, 9½ pounds per lineal foot.

4-inch, 13	pounds per lineal foot.
5-inch, 17	pounds per lineal foot.
6-inch, 20	pounds per lineal foot.
7-inch, 27	pounds per lineal foot.
8-inch, 33½	pounds per lineal foot.
10-inch, 45	pounds per lineal foot.
12-inch, 54	pounds per lineal foot.

Sec. 15. All drain, soil, waste, vent and supply-pipes shall be as direct and concentrated as possible, protected from frost and readily accessible for inspection and convenience in repairing. When necessarily placed within partitions or in recesses in walls, soil and waste-pipes must never be covered except with woodwork, said woodwork to be so fastened with screws (never nails) as to be readily removed.

Sec. 16. Every vertical soil and main waste-pipe must be of cast or wrought iron, and when it receives the discharge of fixtures on two or more floors it must extend at least two feet above the highest part of the roof or coping, except in the case of flat-roof tenement-houses, in which case it shall extend at least six feet above the roof, and said pipe shall have a diameter above the roof at least one inch greater than that of the pipe proper; but in no case shall it be less than four inches in diameter above the roof. No cap or cowl shall be affixed to the top of such ventilation-pipe, but in tenement-houses a strong wire basket shall be provided and securely fastened thereto. Each length shall be securely fastened, and in the case of each line of soil-pipe it shall rest at its foot on a pier or foundation to prevent settling. All joints in cast-iron drain, soil or waste-pipes must be so filled with oakum and lead and hand-caulked as to make them gas-tight, and the amount of lead used shall be not less than twelve ounces to each inch diameter of the pipe so connected.

Sec. 17. Horizontal soil and waste-pipes are prohibited.

Sec. 18. There shall be no traps placed on vertical soil and waste-pipes.

Sec. 19. All changes in direction in cast or wrought-iron pipes shall be made with curved pipes, and all connections with Y branches and one-sixteenth or one-eighth bends, if possible.

Sec. 20. Soil, waste and vent-pipes in an extension must be extended above the roof of the main building, when otherwise they would open within twenty feet of the windows of the main house, or the adjoining house.

Sec. 21. The least diameter of soil-pipe permitted is four inches. A vertical waste-pipe into which a line of kitchen sinks discharges must be at least three inches in diameter, if receiving the waste of five or more sinks, and shall have two-inch branches.

Sec. 22. Where lead pipe is used to connect fixtures with vertical soil or waste-pipes, or to connect traps with vertical vent-pipes, it must not be lighter than D pipe.

Sec. 23. All connections of lead with iron pipes must be made with a brass sleeve or ferrule of the same size as the lead pipe, put in the hub of the branch of the iron pipe and caulked with lead. The lead pipe must be attached to the ferrule by a wiped or overcast joint. All connections of lead waste and vent-pipes shall be made by means of wiped joints.

Sec. 24. Every water-closet, urinal, sink, basin, wash-tray, bath, and every tub or set of tubs and hydrant waste-pipe must be separately and effectively trapped, except where a sink and wash-tubs immediately adjoin each other, in which case the waste-pipe from the tubs may be connected with the inlet side of the sink-trap. In such a case the tub waste-pipe is not required to be separately trapped. Urinal platforms, if connected to drain-pipes, must also be properly trapped, and a supply of water so arranged as to always maintain the seal of said traps. In no case shall the waste from a bath-tub or other fixture be connected with a water-closet trap.

Sec. 25. Traps must be placed as near the fixtures as practicable, and in no case shall a trap be more than two feet from the fixture.

Each and every trap shall be ventilated either by a special vent-pipe of suitable size extending at least two feet above the highest part of the roof of the house (or into a special pipe erected for ventilating purposes only, in which case the area of the special vent must be increased as it passes upward so as to correspond to the combined area of all branch vents passing into it), or by some approved automatic vent. Approved mechanical traps may be substituted where it is necessary or advisable, but only on special permit from the Board of Health.

Sec. 26. The vent-pipe for each water-closet trap shall be at least two inches in diameter, and for traps under other fixtures not less than one and one-half inches. In all cases vertical vent pipes must be of cast or wrought iron.

Sec. 27. Vent-pipes must extend two feet above the highest part of the roof or coping, the extension to be not less than four inches in diameter, to avoid obstruction from frost, except in cases where the use of smaller pipes is permitted by the Board of Health. These vent-pipes must always have a continuous slope, to avoid collecting water by condensation.

Sec. 28. No trap vent-pipe shall be used as a waste or soil-pipe.

Sec. 29. Overflow-pipes from fixtures must, in each case, be connected on the inlet side of the trap of the same fixture.

Sec. 30. No safe under any fixture shall be provided with any drip, waste or notice-pipe. The waste-pipe from refrigerators shall in no case be directly connected with any soil or waste-pipe, or with any drain or sewer, or discharge upon the ground.

Sec. 31. The sediment-pipe from kitchen boilers must be connected on the inlet side of the sink-trap.

Sec. 32. Water-closets must never be placed in an unventilated room or compartment. In every case the compartment must be open to the outer air, or be ventilated by means of a shaft or air-duct.

Sec. 33. All water-closets within the house must be supplied with water from separate tanks or cisterns, the water of which is used for no other purpose. A group of closets on the same floor may be supplied from one tank. Pan-closets and hollow plunger-closets are prohibited.

Sec. 34. Overflow-pipes from water-closet cisterns must discharge into an open sink, or where its discharge will attract attention and indicate that waste of water is occurring; but not into the bowl of a water-closet, nor directly into a soil or waste-pipe, nor into a drain or sewer.

Sec. 35. Water-closets, when placed in the yard, must be so arranged as to be conveniently and adequately flushed, and their water-supply pipes and traps must be protected from freezing. The compartment of such water-closets must be ventilated by means of slatted openings in the doors and roof.

Sec. 36. All waste, overflow or vent-pipes shall be of lead, cast or wrought iron.

Sec. 37. Rain-water leaders, when placed inside of any building, must be of cast iron, with leaded joints, wrought-iron screwed joints, or of copper, with soldered joints. When outside of the building and connected with the drain it must, if of sheet metal with slip joints, be trapped beneath the ground or just inside of the wall, the trap being arranged so as to prevent freezing. In every case where a leader opens near a window or a light shaft, it must be properly trapped at its base. The joint between a cast-iron leader and the roof must be made gas and water-tight by means of a brass ferrule and lead or copper pipe, properly connected.

Sec. 38. Rain-water leaders must never be used as soil, waste or vent-pipes, nor shall any soil, waste or vent-pipe be used as a leader.

Sec. 39. No steam-exhaust, blow-off or drip-pipe from a steam-boiler shall connect with the sewer or with any drain, soil-pipe or waste-pipe. Such pipes must discharge into a tank or condenser from which a suitable outlet to the drain may be provided.

Sec. 40. Every new plumbing system, including those altered or extended, must be tested by the plumber by the air, water or peppermint test, in the presence of a proper officer of the Board of Health; all defective joints must be made tight and other openings made impervious to gases. Defective pipe must be removed and replaced by sound pipe.

Sec. 41. Cellar and foundation walls must be rendered impervious to dampness, and the use of asphaltum or coal-tar pitch in addition to hydraulic cement is recommended for that purpose.

Sec. 42. Cellars and areas should not be connected to the house-drain. Dry cesspools must be used to care for surface-water from cellars and areas, when practicable.

Sec 43. Subsoil-drains must be provided when necessary, and in no case shall these drains have a direct connection with the sewer or the drainage system of any building.

Sec. 44. Yards and open light courts must always be properly graded, cemented, flagged, or well paved, and properly drained; when the drain is connected with the house drain it must be effectively trapped.

Sec. 45. Any person or persons or corporation offending against or violating any of the provisions of Sections 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43 or 44 of this ordinance, shall, on conviction thereof, pay a penalty of fifty dollars for the first offense, and for the second and each subsequent offense the sum of one hundred dollars.

NOTE.—Each city or town can make its specifications in accord with these.

Copies of this circular can be had on application to E. M. Hunt, M.D., Secretary, Trenton, N. J.

For blank forms in execution of the law as used by the Asbury Park Board of Health, see pages 297–301 of this report.

CIRCULAR LXVII.

OF THE

New Jersey State Board of Health.

TO FUNERAL DIRECTORS AND ALL HAVING IN CHARGE THE CARE AND BURIAL OF THE DEAD.

Next to physicians there is no class of our citizens who in their official duties can be of more essential service in preventing the spread of disease and in helping to enlighten the people as to necessary precautions. For their own protection, as well as for that of others, they need to know the most effective measures to be adopted amid the surroundings of fatal disease. Their sanitary relation and jurisdiction include such cleansing, preservation and direction as to the dead body as shall make it least hazardous to the public health, and such dealing with the clothing, furniture and household where the death has occurred as shall prevent contagion or diminish that less specific pollution of air which also is unfavorable to health.

We notice some of the methods of management by which to insure protection:

After death, early attention must be given to any inward parts from which offensive discharges might escape. An egg-shaped plug should be carefully adjusted for this purpose. A small wad of cotton, tow, wool or oakum may be saturated with the copperas or chloride solution, or with tar, or the sticky portion of turpentine, and used for a plug. Better still, carbolized paper or cotton can now be had at small expense and used dry. This is suitable where we need to place an absorbent in the cavity of the mouth, or nose, or ears. A small rubber hand-syringe or spray atomizer easily washes out the most accessible cavities, such as the mouth and nostrils.

All garments that have been used next to the body, or that are in any way saturated or soiled, should be placed in very hot water—180° to 212°—or in some disinfecting solution without being taken from the room. Rags of any kind that have been used to receive the discharges from the mouth or nose or any part of the body should be burned. Other clothing should, in case of contagious diseases, be fumigated, or, in other cases, freely exposed to the air by being hung at the windows and afterward out-of-doors.

The body is best washed off with lukewarm water containing borax in the porportion of a teacupful to two quarts of water, and then should be sopped all over with some one of the solutions hereafter named as adapted for that purpose. After drying by means of towels some also prefer to anoint with vasaline. Dry powdered borax dusted over the surface, after washing and drying, is an excellent cleanser.

As the face and head are more especially exposed, these need the careful cleansing and washing, and use of absorbents heretofore referred to.. Where the hair is long it is desirable that it be partly removed, but if this is objected to, it also can easily and safely be thoroughly washed with the zinc solution. The ancient head-dress or cap easily concealed any change of the hair and would still be in taste if fashionable. It is always necessary that very careful attention be paid to the proper cleansing of the hair; in case of any unusual odor or of any infectious disease the chlorinated soda or Labarraque's solution, or the chloride of zinc solution noted in the article on disinfectants, or a chlorine wash made by dissolving one-quarter of a pound of chloride of lime in a quart of water may be used instead or in addition. The National Board of Health directs the use of a saturated solution of the chloride of zinc as a wash, and the wrapping of the body in a sheet saturated with it. Sawdust well moistened with the chloride of zinc is also recommended to be placed in the coffin. Any sore or abrasion or wound should be cleansed when possible, and be freely covered with copperas wash, powdered charcoal, common salt, or any of the cleansing or drying articles above named.

A small bag of sawdust or fine shavings, or cotton or wool, interlaid with salt, borax or charcoal, may properly be closely pinned about the thighs. One good authority recommends that in some cases of delay or transportation, the body should be covered with sawdust, to which has been added tar or a pound of ivory black, or other crushed or powdered charcoal, so as to absorb any possible gases, or to prevent escape of any fluid. Persons in attendance upon the sick or those laying them out do not increase their risks by such cleanliness. Indeed, those who during sickness, or in caring for bodies after decease, are familiar with methods of cleansing and disinfection are those who themselves escape, besides protecting society.

For purposes of washing we prefer the chloride of zinc solution (butter of zinc in the proportion of 10 per cent. or about three ounces to a quart of water). It is a good disinfectant without odor, and there is no risk of any discoloration therefrom. The fifty-per-cent. solution of Squibb, which costs about twenty-five cents per pound, is convenient. The chloride of lime in solution is recommended by a committee of the A. P. H. Association in the proportion of one ounce and a half to a quart of water. A solution of chlorinated soda, similar to Labarraque's solution, is also now in the market (Squibb's), and may be used diluted with nine parts of water. Those accustomed to it may use instead a colored solution of corrosive sublimate 1 to 1,000 parts.

Where the disease is highly infectious it is usual afterward to wrap the body in a sheet which has been saturated with the chloride of lime or chloride of zinc, or corrosive sublimate solution of double the strength named above.

Solutions of corrosive sublimate should not be placed in metal receptacles, and all disinfectant solutions which are not colored or have no smell should be carefully marked so as to distinguish them from drinking-water.

CLOTHING.

For rendering the clothing safe, the committee before referred to gives preference to a solution of corrosive sublimate and sulphate of copper in the proportion of four ounces of corrosive sublimate and one pound of sulphate of copper (blue vitriol) in a gallon of water.

Any of the following will also be found available: Chloride of lime, 4 ounces to a quart of water; or chloride of zinc, 4 ounces to a quart; or sulphate of zinc (white vitriol), 4 ounces to a quart; or sulphate of iron, one-half pound to a quart. The articles to be disinfected must be well soaked in the disinfecting solution and left in for at least two hours, after which they may be wrung out and sent to wash. Yet, if articles such as admit of boiling in hot water for half an hour are placed into it before removal from the room, and kept boiling, they need no other disinfection.

Clothing or bedding which cannot be washed or subjected to steam can be disinfected by exposure to heat in such forms of apparatus as are now in use in many cities. Where this arrangement cannot be had, and for houses or rooms that need disinfecting, fumigation with sulphurous acid gas is the most reliable. The articles also needing to be disinfected should be unfolded and hung about the room.

To disinfect a room or building so needing disinfection that its contents and surfaces cannot be easily dealt with singly, close the room or building, its windows, doors and chimneys, so as to exclude the outer air as far as possible. Vacate the house. Break roll sulphur in small pieces, place it on an iron plate or other metallic dish and set this on a pair of tongs, or other cross-bar, over an iron pot in which there is water, or over a large box of sand, so as to avoid danger of fire from small particles of burning sulphur. Light it with a few hot coals, or some alcohol poured around the sulphur and lighted. Then leave and shut the door after you. One pound and a half of sulphur is sufficient for 1,000 cubic feet of space. Keep the room closed three hours after the burning has ceased, then flush it well with air for three hours before occupancy. Clothing and bedding needing disinfecting may be hung on lines and left in the room. Most furniture is not injured, but needs dry wiping and washing afterward.

Soiled mattresses, pillows, feather beds and articles of this nature cannot be effectually disinfected by sulphur fumigation, owing to the fact that the gas does not penetrate to their interior in sufficient amount. For articles of this kind and in general for articles of little value, destruction by fire will be advisable, but there must not be exposure of other persons in conveying them to a fire. The need for the destruction of beds will depend upon the disease, the degree they have been soiled, and the thoroughness of disinfection and fumigation that can be secured.

PRESERVATION AND TRANSPORTATION OF BODIES.

In addition to this outside disinfection of the body and its surroundings, means are sometimes used for preservation of the body. Where fluids are drawn off they need to be received into vessels containing disinfecting solutions. Where puncture is made for the purpose of liberating gases a large sponge or cloths soaked with strong disinfectants placed over the mouth of the tube used will receive and disinfect the particles and much of the gaseous matter. The injection of disinfectants into the veins or arteries or into cavities is now practiced by many undertakers, and aids much in preservation.

If the care we have directed as to the body were always exercised, we should have but little of the danger of contracting disease from dead bodies at funerals. Coffins should not be tightly closed for some time and then opened for view. Thus any foul gases are concentrated. The body will thus keep longer if there has been complete exclusion of air, but this is seldom secured. Even then the opening should occur where there will not at once be exposure.

The undertaker needs not only practice, but a technic knowledge of his art. The spray forms of syringes, trocar, sponges, carbolized paper and cotton, bandages, wadding, two or three of the most approved disinfectants, all put up in a case of convenient form, belong as much to his art as does the medical case to the physician.

The last ten years have developed possibilities of care for the dead wholly new and greatly valuable. We believe the time not distant when the occupation will be followed as an exact sanitary art, and become a great adjunct in the checking of contagious diseases. The art of preservation and disinfection is now so complete that if only the undertaker knows the details of proper cleansing and dressing, and keeps himself supplied with the proper appliances of his art, he will not only add to his own skill, but make himself a worthy and effective custodian of the public health.

It is greatly important, also, that the care of the undertaker should extend to the surroundings of the fatal sickness.

He should learn how the rooms may be made least likely to convey disease or to deteriorate the air. We have many times attended at funerals where both the coffin and the room that contained it have been closed for some time before. The stifled air thus charged with particles of decay, even in cases of non-malignant disease, has occasioned faintness and discomfort which might have been avoided by a flushing of fresh air and removal of close curtains.

The undertaker should be familiar with the use and value of circulating air, cleanliness and disinfectants, both for the house and the premises, and often more than any one else just at this time is in a position to give advice and direction which will be heeded and obeyed.

Copies of this and other circulars can be had by addressing by postal, E. M. Hunt, M.D., Secretary, Trenton, N. J.

MEDICAL REGISTRY.

The law makes it the duty of every person settling in this State for the practice of medicine and surgery to file a copy of his diploma, or in case of twenty years' practice in any one locality in this State, a certificate thereof, in the office of the County Clerk. The diploma is not merely any writing or certificate which may be given, but must be from a chartered medical college. The law is founded upon the right of the public to know that those who claim capacity for the treatment of disease should be able to show some evidence thereof. The State really owes it to itself somehow to protect its citizens more fully from the imperfect knowledge and lack of skill of many who, although graduated from inferior institutions, are not fitted for their work. Since the law at present reaches only to the requirement of registry, this must be fully complied with and proper examination made of diplomas presented. The following are the lists furnished by County Clerks for the past year.

ATLANTIC COUNTY.

NAME OF PHYSICIAN.	P. O. ADDRESS.	DATE OF DIPLOMA.	INSTITUTION CONFERRING DIPLOMA AND ITS LOCALITY.
Crowell, Godfrey M........	Hammonton........	Mar. 30, '82	Jefferson College, Phila.
Dougherty, John...........	Atlantic City.......	Apr. 2, '85	Jefferson College, Phila.
Hodges, W. M...............	Hammonton........	Mar. 1, '69	Columbia College, New York.
Ingram, Nelson.............	Atlantic City.......	Mar. 1, '6[illegible]	Bellevue Hos. Med Col., N Y.
Pryor, James E.............	Atlantic City......	Mar. 21, '88	Detroit Col. of Med., Mich.
Rathbun, Greenville A...	Atlantic City.......	Apr. —, '88	Homeopathic College, N. Y.
Siggins, John J.............	Atlantic City.......	Apr. 2, '85	Mich. Col. of Med., Detroit.
Webster, J. Bart............	Atlantic City.......	Apr. —, '87	Philadelphia Med. College.

BERGEN COUNTY.

Archer, William...........	Rutherford..........	Feb. —, —	Eclectic College, New York.
Archer, Hannah E.........	Rutherford..........	Feb. —, —	Eclectic College, New York.
Hamilton, Ezra W.........	Oakland	Mar. 3, '81	Homeopathic College, N Y.
Lambertson, George V...	Lyndhurst..........	May 15, '57	Botanic Phy. and Sur., N. Y.
Morris, Patrick H.........	Englewood	....	Affidavit—20 years' practice.
Vroom, William L.........	Ridgewood	Mar. 6, '88	University of New York.
Ver Nooy, Charles.........	Rutherford..........	Apr. —, '88	Homeopathic College N. Y.
White, Frank H...........	Hackensack.........	July —, '72	University of New York.

BURLINGTON COUNTY.

NAME OF PHYSICIAN.	P. O. ADDRESS.	DATE OF DIPLOMA.	INSTITUTION CONFERRING DIPLOMA AND ITS LOCALITY.
Branin, John W	Mount Holly	Apr. 25, '88	Hahneman College, Phila.
Bayley, Weston D	Burlington	Apr. 6, '88	Hahneman College, Phila.
Gauntt, F. Allen	Burlington	Apr. 2, '86	Jefferson College, Phila.
Goldsmith, Charles A	Bordentown	—— 3, '79	University of Massachusetts.
Harris, William H		Oct. 13, '88	
Ingran, T. E	Burlington	Apr. 2, '88	Jefferson College, Phila.
Kille, Chalkley J	Moorestown	Mar. 25, '78	University of Pennsylvania.
Siggins, John J	Mount Holly	Mar. 2, '85	Michigan College of Med.
Heinekin, Theodore S	Florence	Feb. 24, '88	Philadelphia College of D.

CAMDEN COUNTY.

Damon, S. J	Camden	Dec. 1, '76	Amer. Health Col., Cin., O.
Greene, J. A		Sep. —, '66	Eclectic Medical College.
Marston, A. J		May 9, '76	Eclectic Medical College.
Hylton, J. Dunbar	Palmyra	Mar. 14, '66	University of Pennsylvania.
Gibbs, Godfrey		Mar. —, '84	Jefferson Medical College.
Fortiner, Byron E		Mar. 1, '88	Penna Col of Den. Surgery.
Soper, Augustus		May 20, '88	Col. Phys. and Sur., Ontario.
Soper, Lyman W		May 22, '88	Eclectic, Cincinnati, Ohio.
Delap, W. L	Gloucester City	Mar. 31, '86	Hahneman Medical College.
Adamson, Hans		Apr. 4, '88	Jefferson Medical College.
Lewis, Benjamin Sykes		Apr. 4, '88	Jefferson Medical College.
Hill, E. Hart		Apr. 6, '88	Hahneman Medical College.
Miller, Edwin H		May 1, '88	University of Pennsylvania.
Macfarland, B. W		Apr. 4, '88	Jefferson Medical College.
Lane, J. Lewis		Apr. 4, '88	Jefferson Medical College.
Sharp, Lewis L		Apr. 6, '88	Hahneman Medical College and Phila. Hosp.
King, Joseph H		June 25, '67	Eclectic Med. Col., Phila.
Pursell, John C		—— —, '82	Jefferson Med. Col., Phila.
Lambach, Frederick, Jr		May 2, '87	University of Pennsylvania.
Smith, Samuel Byran		Apr. 6, '88	Hahneman Med. Col., Phila.
Hinds, W. Hugh		May 22, '78	American Health College.
Murray, J. M		Mar. 10, '76	U. P. A. (621 N. Second St.)
Baer, J. S		Apr. 4, '88	Jefferson Medical College.
Hume, Charles		Mar. 4, '82	Missouri Medical College.
Jennings, W. B		Apr. 4, '88	Jefferson Medical College.
Work, R. A		Nov. 27, '8[illegible]	American Health College.
Tucker, Edward J		Mar. 6, '85	University of New York.
Bean, F. A		—— —, '55	Met. Med. Col., N. Y. City.
Braymer, Orange W		Apr. 4, '88	Jefferson Medical College.
McGill, Edw. K		Mar. 10, '80	Hahneman Medical College.
Flower, R. C		Mar. —, '81	Amer. Health Col., Cin., O.
Barnart, Newton H		Apr. 6, '88	Hahneman Medical College.
Emrick, M. Luther		Apr. 4, '88	Jefferson Medical College.
Wright, A	Berlin	Mar. 6, '74	Hahneman Medical College.

CAPE MAY COUNTY.

Leash, Alonzo L	Cape May City	Mar. 17, '68	Jefferson College, Phila.
Pryor, James E	Ocean City	Mar. 20, '88	Detroit Col. of Med., Mich.

CUMBERLAND COUNTY.

NAME OF PHYSICIAN.	P. O. ADDRESS.	DATE OF DIPLOMA.	INSTITUTION CONFERRING DIPLOMA AND ITS LOCALITY.
Damon, James S.	Camden	Dec. 1, '76	Am. Health Col., Cincinnati.
Gladwin, Daniel W.	Camden	Apr. 16, '86	Am. Health Col., Cincinnati.
King, Joseph Henry	Bridgeton	June 25, '67	Collegium Electricum, Pa.
Oliver, David H.	Bridgeton	Apr. 4, '88	Jefferson College, Phila.
Siggins, John J.	Bridgeton	May 21, '88	Mich. Col. of Med., Detroit.
Sharp, Ezra B.	Port Norris	Apr. 17, '88	Acad. Tenar Mariae, Balto.
Thompson, John R. C.	Bridgeton	Apr. 4, '88	Jefferson College, Phila.
Tomlinson, Joseph		Mar. 1, '78	Columbia College.

ESSEX COUNTY.

Ansanelli, Vincenzo		Aug. 20, '73	University of Naples, Italy.
Ardrey, Sarah A.		May 24, '88	Med. Elect. Certif., signed by Dr. Jane H. Murphy.
Braun, Joseph		Feb. 27, '83	Roy. Bavar'n Univ., Munich.
Becker, F. W.		May 10, '88	Col of Phys. and Surg, N. Y.
Christian, Albion C.		Mar. 9, '87	West. Reserve Univ. Med. Dept., Cleveland, O.
Dolphin, Michael O'F.		Dec. 22, '82	Royal Col. of Surg., Ireland.
Diltze, Carolina		Aug. 4, '88	Columbia Col. of Midwifery.
Frey, Albert		May 10, '88	Col. of Phys. and Surg., N. Y.
Groves, Charles A.		Mar. 3, '81	Homeopathic College, N. Y.
Gorska, Eleanora		Apr. 16, '87	Univer. of Posen, Germany.
Goodell, James F.		Mar. 12, '79	N. Y. Homeopathic College.
Harrison, Lucia W.		Feb. 3, '74	Women's Med. College, N. Y.
Hinton, Antoinette W.		May 29, '85	College for Females, N. Y.
Harman, G. W.			
Hampson, Clara Susan		Apr. 1, '88	Electric Med. College, N. Y.
Hopkins, James D.		Feb. 28, '73	N. Y. Col. of Vet. Surgeons.
Ill, Charles L.		Mar. 12, '88	Bellevue Hosp. Med. College.
Krause, Henry G.		Apr. 15, '79	Univ. of Strausburg, Germ'y.
Lehlbach, Charles		May 10, '88	Col. of Phys. and Surg., N. Y.
Lueschow, Mary		Aug. 30, '88	Columbia Col. of Midwifery.
Martin, Peter			Affidavit of service.
Morrison, Alexander		Nov. 17, '67	Glasgow Univer., Scotland.
Mandeville, Charles D.		Nov. 22, '87	Dartmouth College, N. H.
Mandeville, Frederick A.		Apr. 8, '88	Homeopathic Med. College.
Matthews, H. E.		May 10, '88	Col. of Phys. and Surg., N. Y.
Nash, Albert Burr		May 12, '87	Columbia Col. of Ph. and Sur.
Potter, George E.		Jan. 1, '88	Eclectic Med. Col., Cincinnati.
Raffaele, Asselta		Feb. 8, '84	University of Naples, Italy.
Rescunti, Antonio		Aug. 8, '87	University of Naples, Italy.
Richards, G. Herbert		Apr. 15, '85	N. Y. Homeopathic College.
Seidmann, Marco		May 6, '86	Ludovicia College, Bavaria.
Sutton, Edward		May 10, '88	Col. of Phys. and Surg., N. Y.
Simmons, M. Herbert		Mar. 2, '80	Albany Medical College.
Vaughan, Horace		Apr. 4, '88	Jefferson Med. Col., Phila.
Wendel, Augustus V.		Mar. 15, '88	Col. of Phys. and Surg., Md.
Wallhauser, Henry J. F.		Mar. 6, '88	University of City of N. Y.
Woodruff, Frank Crane		Apr. 14, '87	Homeopathic College, N. Y.

GLOUCESTER COUNTY.

NAME OF PHYSICIAN.	P. O. ADDRESS.	DATE OF DIPLOMA.	INSTITUTION CONFERRING DIPLOMA AND ITS LOCALITY.
Ashcraft, Samuel Fisler	Mullica Hill	Apr. 4, '88	Jefferson Med. Col., Phila.
Burchell, John Gale		Apr. 27, '65	Eclectic Med. Col., Phila.

HUDSON COUNTY.

Bogardus, Henry J		July 11, '88	University of New York.
Bull, Edward L		May 10, '88	Col. of Phys. and Surg., N. Y.
Dolphin, Michael O'F		Dec. 22, '82	Royal Col. of Surg., Ireland.
Drayton, Henry S		Mar. 1, '87	Eclectic Med. College, N. Y.
De Long, Arthur D		Mar. 9, '88	University of New York.
Ennis, Thomas		Jan. 15, '88	Victoria Med. Col., Quebec.
Grew, Francis B		Apr. 16, '75	Roy. Col. Surg., Edinburgh.
Humphrey, Cornell L		Jan. 24, '65	Geneva Med. College, N. Y.
Henning, Richard		Dec. 19, '88	Affidavit—20 years' practice.
Kuehne, Richard		May 10, '88	Col. of Phys. and Surg., N. Y.
Lewis, William C., Jr		Mar. 10, '80	University of Pennsylvania.
MacRae, Thomas D		Mar. —, '84	University of New York.
Myers, Euphemia J		Apr. 3, '88	Women's Med. College, N. Y.
Nabers, A. J		July —, '84	Kentucky Medical Academy.
Nevin, William R		May 18, '87	Homeopathic Med. Col., N. Y.
Schumann, Carl		May 18, '87	Homeopathic Med. Col., N. Y.
Stanwood, Robert G		July 5, '78	Bowdoin College, Med. Dept.
Shain, Francis W		Mar. 13, '87	Jefferson Med. Col., Phila.
Small, Edwin		Mar. —, '85	Col. of Phys. and Surg., Md.
Towle, Henry A		Nov. 1, '87	Col. of Phys. and Surg., N. Y.
Williams, Thomas D		May 1, '85	University of Pennsylvania.

HUNTERDON COUNTY.

Archer, William	Clinton	Feb. 4, '69	Eclectic Med. College, N. Y.
Archer, Hannah E	Clinton	Feb. 4, '69	Eclectic Med. College, N. Y.
Dunning, William Barry	Lebanon	Mar. 1, '71	N. Y. Col. of Phys. and Surg.
Follets, William Mann	New Brunswick	Mar. 1, '83	Eclectic Med. College, N. Y.
Nash, A. B	Frenchtown	Mar. 10, '76	University of Pennsylvania.
Seip, George W	Reading, Pa	Mar. 8, '62	Jefferson Med. Col., Phila.

MERCER COUNTY.

Fowler, Richard C	Trenton		Am. Health Col., Cincinnati.
Sinne, Hans H	Trenton	Apr. 5, '87	Jefferson Med. Col., Phila.
Murray, James Munro	Pennsylvania	Mar. 10, '76	University of Pennsylvania.
Damon, S. James		Dec. 1, '76	Am. Health Col., Cincinnati.
Gulick, Arnatt Reading	Trenton	Mar. 12, '88	Bellevue Hosp. Med. College.
Kline, Andrew K	Somerville	Apr. 13, '88	N. Y. Homeopathic Med Col.
Wells, Joseph M			Jefferson Med Col., Phila.

MIDDLESEX COUNTY.

NAME OF PHYSICIAN.	P. O. ADDRESS.	DATE OF DIPLOMA.	INSTITUTION CONFERRING DIPLOMA AND ITS LOCALITY.
Beekman, Jesse H........	Sayreville...........	—— —, '88	Hahneman Medical College.
Donahue, Lawrence A...	Perth Amboy......	Mar. 1, '88	University of New York.
Follett, Henry A...........	....	—— —, '87	Georgia Medical College.
Keasbey, William P......	Perth Amboy......	Mar. —, '88	College of Phys. and Surg.
Lang, Maria A. S........	....	—— —, '87	College of Midwifery.
Ramsey, William E.......	Perth Amboy......	May 10, '88	College of Phys. and Surg.
Siggins, John J.............	....	Apr. 2, '85	Michigan Medical College.

MONMOUTH COUNTY.

Baker, George Fales......	....	Mar. 2, '70	University of Pennsylvania.
Bell, James H	....	Mar. 25, '84	Jefferson Med. Col., Phila.
Clarke, J. C.................	....	Apr. 6, '88	Hahneman Med. Col., Phila.
Dunbar, Thomas, Jr......	....	Apr. 4, '88	Jefferson Med. Col., Phila.
Gage, Mary Emmerson...	....	Apr. 20, '86	Medical Academy of N. Y.
Hopkins, Richard S.......	....	May 1, '88	Dental Dept Univ of Penna.
Hinman, Richard E.......	....	Apr. 1, '88	N. Y. Homeopathic College.
Jones, Dixon.	....	May 15, '83	Columbia College
Laney, John C..............	....	Apr. 2, '83	Jefferson Med. Col, Phila.
MacMillan, William T...	....	Mar. 10, '88	Baltimore Medical College.
Meyer, Alfred...............	....	Mar. 10, '87	Col. of Phys. and Surg., N. Y.
Negley, Henry A..........	....	May 10, '88	Columbia College.
Reed, Jacob J...............	....	May 2, '88	Columbia College.
Tindall, D. M...............	....	Mar. 2, '41	Pennsylvania Med. College.
Whitmore, Walter S	....	Mar. 7, '87	University of New York.

MORRIS COUNTY.

Bradford, F. Standish.....	....	Mar. 9, '58	Jefferson Med. Col., Phila.
Bell, Jacob F...............	....	Mar. 13, '85	University of New York.
Cook, Richard L...........	....	Mar. 15, '86	Col. of Phys. and Surg., Md.
Coates, George C..........	....	Mar. 6, '88	University of New York.
Gorton, Eliot	....	Mar. 9, '88	Long Island College Hosp.
Harris, H. C................	....	Apr. 23, '83	University of Pennsylvania.
Kice, Henry William.....	....	Mar. 6, '88	University of New York.
Mial, L. L....................	....	May 2, '87	University of Pennsylvania.
Rogerson, Robert..........	....	Sept. 20, '59	Faculty of P. and S., Glasgow.
Risk, J. Boyd	....	Mar. 14, '79	University of Pennsylvania.
Spratling, W. P............	....	Mar. 13, '86	Phys. and Surg., Baltimore.

OCEAN COUNTY.

Cate, Henry Hamilton...	Lakewood...........	Apr. 6, '88	Hahneman Med. Col., Phila.
Adler, Lewis H., Jr.......	....	May 1, '88	University of Pennsylvania.
MacMillan, William T....	New Egypt.........	Mar. 22, '88	Col. of Phys. and Surg., Md.

PASSAIC COUNTY.

NAME OF PHYSICIAN.	P. O. ADDRESS.	DATE OF DIPLOMA.	INSTITUTION CONFERRING DIPLOMA AND ITS LOCALITY.
Alderton, Henry A.		Sept. —, '84	Columbia College, N. Y.
Agnew, Francis E.	Paterson	May 12, '85	College of Phys. and Surg. Columbia College, N. Y.
Atkinson, James W.	Paterson	June 2, '86	Long Island Hosp. College.
Born, Reuben Hill	Paterson		Bellevue Hosp. Med. College.
Berdan, Edith (for. Hale)	Paterson	Mar. 1, '83	Univer. of Ohio, Cincinnati.
Balcom, Lafayette	Paterson	Feb. 23, '64	Buffalo University.
Crooks, James, Jr	Paterson	May 18, '87	N. Y. Homeopathic Med. Col.
Cunningham, William P.	Passaic Bridge	Mar. 14, '87	Bellevue Hosp. Med. College.
De Uling, Ernestus B.	Paterson	Sept 10, '62	University of Vienna.
Gillson, John Thomas	Paterson	Mar. 12, '88	Bellevue Hosp. Med. College.
Hopper, C. Percy	Paterson	Mar. 15, '83	Homeopathic College of N. Y.
Harrison, J. Charles	Newark	Mar. —, '83	Electric Med. Col., Chicago.
Kearns, Robert	Paterson	May 10, '88	Columbia Col. Phy. and Sur.
McEncroe, J. F.		May 12, '87	Columbia Col. Phy. and Sur.
Norris, Ida Florence	Paterson	Apr. 20, '86	N. Y. Med Col. for Women.
Palmer, George M	Paterson	Mar. 4, '80	Electric Med College, N. Y.
Paton, Thomas Lloyd	Paterson	Mar. 25, '87	Md Col. of Phys. and Surg.
Tuller, Malcolm B		Mar. 10, '73	Hahneman Med. Col., Phila.

SALEM COUNTY.

Siggins, John J.		Apr. 2, '85	Mich. College of Medicine.

SOMERSET COUNTY.

Sutphen, Fred. Cornell	Liberty Corner	June 18, '88	University of City of N. Y.

SUSSEX COUNTY.

Croskery, Robert	Ogdensburg	Jan. 2, '67	Edinburgh Roy. Col. of Phys.

UNION COUNTY.

Gibb, W. Travis	Plainfield	Mar. 6, '86	University of City of N. Y.
Jones, Herbert Samuel	Elizabeth	Apr. 13, '88	N. Y. Hom Col. and Hosp.
Perry, Charles F.	Elizabeth	May 1, '88	University of Pennsylvania.
Rupp, Philip	Plainfield	May 12, '87	Columbia College, N. Y.
Siggins, John J.	Elizabeth	Apr. 2, '85	College of Medicine, Detroit.
Westfall, E. James	Rahway	—— —, '71	Columbia College, N. Y.

WARREN COUNTY.

Anderson, George R.			University of Pennsylvania.
Cavenaugh, James J., Jr.	Belvidere	—— —, '84	Bellevue Hosp. Med. College.
Jacoby, Aaron P.	Phillipsburg	—— —, '87	Jefferson Med. Col., Phila.
Rowell, S. N.	Vienna	—— —, '52	Yale College.

REPORT

OF THE

BUREAU OF VITAL STATISTICS

OF THE

STATE OF NEW JERSEY

FOR THE

Statistical Year from July 1st, 1887, to July 1st, 1888,

WITH CLIMATOLOGY, DECENNIAL TABLES, ETC.

By EZRA M. HUNT, M.D., D.Sc.,
Secretary and Medical Superintendent of Vital Statistics.

REPORT ON VITAL STATISTICS

BY THE MEDICAL SUPERINTENDENT OF VITAL STATISTICS.

INTRODUCTION.

The present report completes the first decade of registration of vital statistics under the present system. It would have been in some respects more convenient, and much better for comparison with other States, if our statistical year, which begins July 1st, could have begun with the civil year; but inasmuch as our system went into operation in the middle of the year and report must be made to the Legislature in January of each year, it was not regarded as satisfactory to have the report fall over a year behind. The State and this Bureau are under the greatest obligations to the Hon. Henry C. Kelsey for his recognition of the relation of these statistics to health administration, and for his co-operation with us in the co-ordinate relations which his department bore to these records. As the books of record necessarily came to be in the health department, and even for all searches and references recourse must be had also to this office, it was his judgment and advice that the entire charge of this Bureau should be transferred to the State Board of Health. Accordingly, by an act of the last Legislature, the Bureau of Vital Statistics is under the full charge of the State Board of Health. Besides the indispensable value which these statistics have in the study of all questions relating to health and population, we are also authorized to give such certificates as may be necessary in questions of age, residence, pension, to prove the dates of the several events, or for any other purposes in which legal questions may be involved. The marriage, birth and death returns for the State have now, for ten years, been so collected and arranged as to be readily accessible for all purposes of legal inquiry, for all needs relative to social and economic questions, and for study in their intimate relations to a care of the public health. While each year shows a gain in accuracy of returns, it also brings to view some defects and urges us to efforts for increasing accuracy. While knowing the approximate value of the figures of each yearly report, we have never failed to present the fact that accurate conclusions as to the death-rate, the marriage-rate or the birth-rate of any locality cannot be based upon the figures of any single year. It is equally true that we need to deal with larger aggregates of population than are afforded even by populous cities. It is for this reason that we attached so much importance to the quinquennial report made in 1883, and now attach still more importance to the two quinquennial, or combined decennial report which we are able to make this year. It will be the chief object of this report, in addition to the usual annual report of vital returns, to present these figures in a way in which they may be studied and compared. We are aware of the very many other combinations which could be made, and which are deemed important by the highest statistical authorities. The material for these combinations will be found fully on record in the office. Within the scope of our appropriation, we use those which are really the most informatory and valuable, and thus help to guide physicians, health officers, sanitarians and statisticians in the study of those vital questions bearing on the health and vitality of population. We believe the time is coming when each individual will be studied as related to the resources and prosperity of the State, even as to his individual health. No other question so much involves our industrial prosperity as that of the health capacity of the individual and the tenure of his life. It not only determines the number of the producing classes, but that equally important question of how large shall be the number of the dependent classes. And it is to be remembered that these latter not only cannot contribute to the general stock of human industry, but become a tax upon resources which otherwise would be available in more profitable directions.

Even these beginnings of an orderly study of population in its most vital events helps to direct public and expert attention to the importance of the care of the people, and especially of such provisions as shall protect them from those destructive influences to which these statistics show them to be exposed. For it is only by such knowledge, as a part of political economy and resulting in legislative enactment, that the welfare of the people can be conserved. While knowledge of the laws of personal health may do much for us, Dr. Russell, the Health Officer of Glasgow, has well said that "nothing is more conspicuous than the helplessness of the individual, under the conditions of civilized life, to secure the physical basis of health."

He is comparatively helpless against impure water, imperfect foods, contaminated air and against the invasion of insidious endemics and epidemics, unless his government informs itself as to the facts, as to causes, gets at the ages and circumstances of the material exposed and then collects such statistical data as admit of accurate comparison. Thus it is that we here collect information for the study of disease in its varieties, localities and modes of invasion. Of the study also of other vital relations of populations that bear on all social and life conditions and add our quota to aid in securing a prolongation of life, a mitigation of disease and that prosperity and happiness so dependent upon human health.

PERILS OF POPULATION.

RECORDS OF THE CONDITIONS AND PERILS—HOW THEY ARE TO BE STUDIED, AND THEIR USE AS PRACTICAL GUIDES TO THE PREVENTION OF DISEASES.

Vital statistics furnish one of the accounts which the State keeps of its population.

The very word "statistics," as first used by Prof. Achenwall, of Göttingen (1749), had reference to inquiries into the resources of a government, of which the people are the first and the greatest element. Eliot, the statistician, in his definition of statistics, puts first and foremost "facts relating to population, deaths, births and marriages; health, disease and duration of life." Even as early as 1660, Conring, professor of medicine and politics in the University of Helmstad, had discussed facts or records as to their bearing on public health and happiness. The London Statistical Society (1835) was not slow in seeing the importance of vital statistics, and no doubt led the way for the English law of 1837. As the people are a material resource, vital statistics have the same relations to the State as have any other statistics which are gathered for the purpose of indicating lines of progress or decrease.

In another aspect they are the legal record which is needed to guide as to various questions of age, marriage, pension, military service, citizenship, &c. Either of these would not only justify but require that such records be kept and studied as to their social and legal bearings. These also have some incidental significance for comparisons, as we shall hereafter see. It was not until much later that it came to be recognized that not only must vital statistics be studied in their effect upon population as bearing upon progress and upon social conditions, but that for medical and health purposes, and in order to know the causes and courses of vitality, we must deal with this class of statistics in still another direction. In other words, the physician must also have access to numerical records if he desire to subject his art to the test of results on the one hand, or if as a science he desires to be guided to causes on the other. Still more the practitioner of the health-preserving and sickness-preventing art must thus obtain some of the foundation-stones on which any upbuilding of the science and art of sanitation must rest.

It would somewhat have aided in perspicuity if the three designs could have been kept totally distinct. Then, while each one engaged in the collection of the facts within his own sphere of inquiry would have known what the collection was being made for, the student of statistics in relation to diseases and their prevention would have been equally able, borrowing the little he needed from the others, to study the combined results. But as it is not practicable to collect the items for the three objects separately at different times, and with different officers, all are collected together. To many this is a source of confusion, since the lawyer scarcely sees why it is of much consequence what a person has died of, so long as he has died without violence, and that there is legal record of his death. The student of sociology cares chiefly for age and occupation, and the period of working activity in its influence on the development of industries and the progress of the State, while the physician regards the marriage and the birth as not very important as medical facts, and looks upon diagnosis and statement of the disease and its result as the only points bearing either on the science of medicine or demography, or of hygiology.

It cannot be expected that any one of us should be able to investigate the reasons for methods and details in any given inquiry unless we have full time therefor. It is, therefore, a great satisfaction to be able quietly to rely on competent testimony or assertion as to what is necessary to be done in order to carry out the design of any given science or art, and to accept the axioms to which such subscribe rather than depend upon what must be, to those busy in other directions, a mere superficial study.

Happily for us, there are many settled convictions of those who have achieved success in this line which we may accept, and from which we may work forward and onward without fear that the foundations are not firm. The whole system, so far as sanitary science is concerned, grew out of mathematical and not out of experimental methods.

Dr. H. I. Bowditch, of Boston, not less distinguished as a medical than as a sanitary practitioner, spoke of the second great epoch in medical science as related to hygiene as beginning about 1832 and closing about 1869. He calls it the epoch of the accurate recording of facts and subsequent analysis of them, and regards them as revealing the tendency of most diseases to recover without active medication if any of the resources of nature are made available. So he takes this epoch as the introduction to the preventive art. Louis, in France, and Gerhard and Jackson, in this country, became the pioneers in what has ever since been callèd the numerical method of studying disease, and in what the sanitary art calls the numerical method of studying the prevention of disease. It is based on such close observation as leads to medical book-keeping, such as is furnished either by the record of each day's facts as to a given disease, some of them numerical, seme of them graphic or by lines and charts, and some of them described by words. In each of them precision and record is the idea, all the more significant and important because the effort at precision will no doubt reveal some discrepancies and some misleading facts or figures. If so, two results follow—the one, an effort at greater accuracy, and the other an acquired tact or expertness in dealing with the inaccuracies, so that with them we shall have accurate methods for making allowance for them, and for canceling them in the equation so that they shall not be disturbing quantities, or only to an appreciable extent. The statistician also by this method acquires tact and accuracy in dealing with truths as well as in eliminating errors. Vital statistics very early had the advantage of commanding the services of men who were competent, scientific and mathematical witnesses to the feasibility of numerical methods, as also of those who did much to furnish plans for detecting errors and arriving at accurate formulas for estimating the disturbances caused.

Halley, the inventor of life tables, had tested his astronomical calculations by their verification, and "believed in the constancy of the laws of nature, and ventured, from a knowledge of a part of a course of a comet, to predict" when it would return, as it did after his death. He also conceived the possibility of defining the course and conduct and studying the variations of human life, and so brought the science of numbers to bear on health, disease and longevity. It was not until after the most accurate study of methods and results that Beneké, the great German statistician, said that "mortality statistics are the basis of public as well as private care of health;" or

Farr, of England, that "deaths and causes of deaths are scientific facts, which admit of numerical analysis;" or the American statist, De Bow, that "the experience of all countries preserving such records shows a marked amelioration of society, diminution of disease and extension of the average period of human life."

When we add the testimony of such statisticians and scientists as Parent-Duchatelet, Bertillon, Quetelet, Snow, Baker, Billings, and many others who have made close and accurate studies of systems and variations, and when their views have been accorded in by the leaders of sanitary science, who have availed themselves of results and predicated successful administration thereupon, we need not be in any doubt as to the feasibility of such collections, as to the significance of such records, or as to the progress in their study which is sure to be made.

We must, therefore, be pardoned for not attempting further in this paper to allude to their necessity, but spend the space we have in indicating what use should be made of those already collected, what deductions can be drawn therefrom, what false deductions are attempted and should be avoided, and what defects either in collection or combination should be corrected.

While in doing this I shall no doubt weaken the force of statistics to those who are by constitution or education of a skeptical turn of mind, and afford them objections which will weigh on their own minds, I shall at least show that my duties have led me to no blinded enthusiasm, but to a confidence of result, based on testimony and experience, in the midst of disturbing elements.

As to marriages and births, we shall not have time to analyze the figures, a work needing much to be done, but for which the present State provision is not sufficient. The records are so made, however, as to be fully available, if, at the end of years, any competent statistician should be put at work upon them for only a single year.

As they are now studied they are available as showing their bearing on the combinations of populations and on increase, and as defining the conditions and age of material with which disease and death have to deal. It was an advance when we also secured through the census a record of the number of houses in each city and township, the number of families, and the number of individuals in each. It is a great thing to have collected the materials in such form as that the future student can find them available when public sentiment and the

State authorities conclude that such statistics are vital to the general interests of population and progress. The large number of facts thus collected over a series of years will also render the conclusions therefrom more reliable than they could be with small numbers and brief periods of time.

We shall therefore confine ourselves to the consideration of the returns of deaths, and the uses to be made of them in conserving the health interests of the State.

They are valuable *en masse*, or in their entirety, first as indicating the general mortality of the population, and the diseases by which it is limited or destroyed. We desire to emphasize the words *en masse*, or entirety. Nothing can be more subversive of the real use of statistics than a wholesale statement of the number of deaths per thousand and an inference of sanitary conditions therefrom, unless the population on which they are based is 100,000 or over, and unless right alongside there is a statement as to the diseases which have occasioned the deaths, the age of the material exposed, and the ages of those dying. The death-rate in gross is merely the statement of a leading fact, which is to form a nucleus for the arrangement and comparison of other statements, both as to mortality and morbility. We are not to stop with the statement of the facts, but to go to work to analyze causes and to consider facts which will make them more or less significant. If, for instance, it appears that the great excess of mortality had been caused by an epidemic of small-pox, it would not tell against the general healthfulness of the locality, but would tell against the sanitary administration of the town, which should have seen to it that vaccination was prevalent instead of the small-pox. If the increase has been owing to an epidemic of measles, this again would not lead to any conclusions as to sanitary conditions or general unhealthfulness; but it would lead to a study of the cases in their relation to climatological conditions, and to a study of any special causes of excessive mortality, such as the age of those attacked, their peculiar exposure by reason of bad housing or surroundings, and as to whether the fatality was chiefly from pulmonary lesions. If, in every epidemic of measles, through a score of years, any place averaged an excessive mortality, it would lead to the conclusion that locality or the particular climate had something to do with it. At least, let no physician or citizen get it into his head that the death statistics are only designed to show the sanitary condition of the locality. In a sphere, and properly used, they show him much about this, but many things more important.

But, independent of special epidemics, there are still other considerations.

The vital statistician, getting the aggregate of deaths before him in sufficient numbers, for long periods of time, then studies the class of diseases, the number of deaths in proportion to the population at each classified age, the causes of death as compared with each class of age and of persons, and so brings the problem far more within the range of definite information and certainty. With this kind of analysis the statistician may be able to see where to look and what to look for before other people, just as the astronomer anticipates, on the basis of calculation, the appearance of a comet.

Our marauding pestilences resemble comets in some particulars, and have their orbits and their laws as well.

But nothing is more unsatisfactory than the conclusions as to the health of populations under 100,000, derived merely from the general statement of the death-rate. On July 1st, 1888, we completed the vital statistics for ten years, or our first decade of registry. If we will now unite the death-rates for the ten years, if we will then reckon the periods of life in proportion to population at which each series of deaths has taken place, and the numbers from each disease, and locate as far as possible the special areas which show the highest mortality, we shall then have some very important guides to conclusions.

Even before this is done we are able to give prominence to the significance of certain facts. An average general death-rate from fevers has especial significance, and especially from typhus, typhoid and remittent or miasmatic fevers. These are especially fevers likely to be identified with local conditions, so much so that typhus has unmistakable relations to animal life and excretions—that typhoid was called by Murcheson pathogenic or putridity fever, often, as he thought, "generated spontaneously by fecal fermentation;" and the remittents have been and still are regarded as related to paludal conditions. The last English report speaks of typhoid fever as the "best single test of sanitary condition." The only limiting item as to the two former is that they may have been imported, but even this item can be calculated, and if there is great spread, it points usually to bad local conditions or bad sanitary administration which admits of characterization. The limiting factor as to conclusions in respect of the paludal fevers is that the number of deaths is not a uniform index to the number of cases or the prevalence of the cause. Knowing this, however, where deaths occur it is not difficult to get an estimate of the amount of sickness from this cause.

Next in significance we should place diarrhœas and dysenteries, which, if studied by persons, ages and localities, are uniformly found indicative as to local or preventable causes of disease. Next we should place diphtheria, since an increasing number of facts identify it as frequently having local origin and as related to inclosed dampness amid decayable materials. The figures of Bowditch and Buchanan as to tens of thousands of cases also show that statistics of consumption followed through years point largely to soil-moisture, bad drainage and organic vegetable matter, while the statistics of Greenhow, Hurt, &c., show how in cities the element of foul air influences these diseases among indoor operatives. Then following on with other preventable diseases and giving to each it's real significance, it is not suprising that the specialist in these departments is able to reason as accurately as in any other department in which results are partly mathematical and partly experimental, and so come to be the facts of analysis and of experience. Nor is it enough to make one division of preventable and non-preventable diseases and study each as a unit. Both of these classes have their own special significance, and are to be compared with each other and then those of each class among themselves. Given, that a disease has been brought to a place and so had its origin independent of the locality and the people residing in it. Yet vastly much as to the number of cases or deaths will depend upon the general sanitary condition of the locality, and still more in some cases upon the prompt recognition of cases, the enforcement of isolation and all the detailed rules of the efficient Sanitary Inspector. Non-preventable diseases are in some respects as to the degree of fatality just as controllable by efficient health administration as are the class known as preventable diseases. With the number of deaths before us in any given locality we do not at once conclude that all is owing to the insalubrity of the locality, or to some one or more special epidemics brought there, or to errors in isolation and sanitary inspection. But with the numerical facts as the basis for inquiry we make other inquiries, and very often are able to find that some one physician in town has stayed an epidemic, or some

Board of Health or Inspector by promptness or by neglect has determined the series of events that have happened.

We next inquire as to the deaths recorded in this State for the past ten years, what tables of most value can be constructed from them, and should be, so far as the provisions for this particular object will permit.

They should be, first, total number of deaths, with ages and principal causes. The divisions we have are, under one year, one to five, five to twenty, twenty to sixty, over sixty. As certain specified or principal diseases, we tabulate all the so-called communicable diseases, with diarrhœa and consumption, and a few others that relate to organs or systems, as the circulating system, the digestive system, &c. It would be better, after five years, to go by decades, but it makes far more work than is provided for, and the classification as we have it is not misleading.

The next item after statement of the deaths of each locality and at specific ages from each disease, and after the comparative statement of the same, is to ascertain what proportion of the deaths comes within the category of preventable diseases, and to give due weight to each of these. This, in decennial statements, is best done by giving the deaths from each so-called preventable disease, so that combinations may be made in order and due importance given to each, and then the whole massed and the proportions shown.

Whoever will compare the reports made on vital statistics by this Board, and read each outline of method and reasons therefor, before seeking to study tables, will, we think, find a key to method which will be valuable. With this should be read the special article on the Study of Consumption as a Preventable Disease, and the one on English Statistical Reports, contained in the fifth report (1881). Such comparisons, for instance, as those on pages 253–4, continued through a series of years, cannot but reveal the relations of locality to consumption, and point to a still further analysis of causes, both in city and country. The same will apply to fevers, to diarrhœa, to diphtheria, and measurably to some other diseases.

It is easy to claim that by reason of errors or defects of return, you cannot draw safe deductions from imperfect data. This sounds quite conclusive. But, if absolutely true, some of the best-sustained mathematical formulas which depend upon the balancing of errors and the elimination of disturbing quantities, become annihilated. Some of the tests which experience has shown as confirmatory to these deductions, would become inexplicable.

Farr, after forty years of experience, and after submitting his conclusions to the examination of the first mathematicians of his age, is not mistaken when he says: "The deaths and causes of death are scientific facts which admit of numerical analysis."

Again, after twenty years of registry, he says: "We have now before us the results of observations in a certain class of phenomena. They are as valuable as the experimental philosopher could have deduced from his experiments if he had had the power to expose the population to great vicissitudes of heat and cold, of dampness and dryness; to changes incidental to differences in the price of food; to air and water in different degrees of impurity, and to destructive epidemics."

This is another illustration that, in studying statistics, we are seeking in general the causes of all disease, and not merely those incident to the locality. It is all the more important because the finding of cause has so much to do with prevention, as also often with cure.

If any of the statisticians could by any possibility be accused of infatuation in their chosen pursuit, that cannot be said of those students of sanitation such as Varrentrap, Simon, Buchanan, Russell, Baker and many others who, as practical administrative officers, have recognized these as among the finger-boards directing to practical sanitary measures, although themselves not directly concerned with their collection or analysis.

What shall be done by Local Boards of Health in their relation to the vital statistics of the State?

I. They should be careful not only to encourage but to secure their accurate and complete collection. It is not to be expected that every member of a Health Board can or will understand their full import. But inasmuch as their full collection accords with the common sentiment—"*communis sensus*"—of sanitary students and practical administrators and sanitarians, the fact of the necessity should be accepted.

II. They should be careful not to have the citizens base conclusions upon these alone. They should tell such citizens that a place may have in it causes of ill-health and for reducing the vigor of population that do not express themselves in a death-rate, or express themselves only at remote periods or by some sudden outbreak, and that while they give important information and indications, they are not alone and in themselves the full tests of salubrity.

Lord Stanley puts it thus:

> "Do not fancy that the mischief done by disease spreading in a community is to be measured by the number of deaths which ensue; that is the least part of the result, as in the battle the killed bear but a small proportion to the wounded. It is not merely by the crowded hospitals, the frequent funerals, the destitution of families or the increased pressure of the public burdens that you may test the sufferings of a nation over which sickness has passed; the real and lasting injury lies in the deterioration of the race, in the seeds of disease transmitted to future generations, in the degeneracy and decay which are never detected until the evil is irreparable."

III. In each Board, and especially in each city Board, some one should be studying the subject of vital statistics as described in at least eight reports of this Board and elsewhere, as well as in the tables furnished in these reports. These tables are often only the material for further calculations to be carried on by those into whose hands they fall in localities.

IV. In each city, or wherever there is density of population, the local record should show the number of the house as well as the street at which each death takes place, and the cause of death. For present purposes, as a rule, the report of any death in a house having more than one family in it should at once lead to a visit of the Sanitary Inspector, and for future statistical and sanitary purposes a map should show the locality of each case. Such record-maps of disease are invaluable. At the time it is not difficult for the Sanitary Inspector to get a record of other cases of sickness that do not prove fatal, and this should be preserved for reference, and really made use of when the local statistician comes to make up his yearly statement. Physicians, too, if called upon at the time, are ready to give information as to cases; and where a disease is coming to be epidemic, and in the case of larger cities, in all the more communicable and dangerous diseases, report should be required, so that the sanitary officer may know just what is happening. Let any local health officer thus study some of the facts for immediate use, and others to be arranged and studied out at the end of the year, and from year to year combined as they accumulate, and he himself is surprised at the satisfactory and informatory character of the results. We believe that one great reason why statistics are not more appreciated by the laity is that they see no practical studies of them or results from them. Figures go far with the mathematician, but to ordinary minds they go a great deal further if a map delineates their results, or if a verbal statement accompanies them.

No health office of any large city is complete in its work unless it does something of this kind. The annual local statement to the public should tell how many have died at each five years of age, of what disease, the number of the house, how many inmates it had, and should be accompanied by such suggestions as to causes and as to sanitary needs, as the facts may warrant. It should also occasionally point out that while these statistics are valuable as an aid to the study of local conditions, they are also valuable in the study of the effects of age, heredity, types of disease, food and milk-supply, weather, medical skill or carelessness, and as throwing light on various other matters that concern the welfare of the population. Simon remarks, among other things, that the death certificate, while aiding in various health directions, is also a mild coroner law for all the Kingdom. We are apt to find fault with imperfections or neglect of returns, but so far as deaths are concerned, we believe these to be more complete than the use made of them in studying various phases of social life and the varying conditions of personal and public health.

When a citizen sees a statement that the death-rate in his city was only twenty-five per 1,000 the past year, let him know that such bare fact does not, to him, indicate very much as to healthfulness. The statistician does use it as one of many facts for comparison, and if, for instance, as is the case, he finds the death-rate of London, with its five and a half millions of people, only 17.5 per 1,000, he does bear in mind the contrast. But with this as only a starting-point, he goes on to compare ages of death, so as to know how the significance of number is modified by the significance of age. He then proceeds to find how both of these are modified by the significance of diseases, as deaths by some diseases mean far more, as to local sanitary conditions, than is meant by the same number of deaths from some other diseases. But the statistician gets on. He then asks in what part of the city, in what kind of houses, they died, and what were their advantages or disadvantages as to food, water and care. He also, as far as possible, inquires into heredity, vitality, into the rate of sickness as compared with the death-rate, and into other indications which show how the general race vitality and general working-age, and how the endurance of the population are being affected; for these are not always in exact proportion to the number of deaths.

The evils of statistics are the drawing of hasty and unauthorized conclusions from them. Their value is that in their study, comparison and assortment, they furnish to us some of the valuable materials which, joined with other information, enable us to practically deal with the limitation and prevention of disease.

Thus, by restraining the people, and sometimes ourselves, from hasty generalizations, and by using the records as parts of evidence and only for purposes intimated, we shall find them highly valuable in aiding in the prevention and the cure of disease, and in guarding the life, health and welfare of population.

HOW TO RECKON AS TO THE REAL OR COMPARATIVE HEALTHFULNESS OF COMMUNITIES.

There are various methods which aid us in ascertaining what are the health conditions of particular localities, or of a whole State. To the superficial observer it cannot but seem that there are many sources of error. The student of mortality or of morbility is not slow to perceive what these disturbing elements are, and to set himself to work so to estimate and allow for them as to arrive at a conclusion sufficiently approximate to be valuable.

The skilled physician is seldom able to make his diagnosis depend upon one unfailing or pathognomonic symptom. It is by his skill as a clinician that he is able to collect the evidence, to sift its meaning, to give to each symptom its due import, and thus to sum up his evidence into a correct diagnosis. Even if the diagnosis is not absolutely perfect, in the process, he gains much valuable aid and direction as to treatment. It is just so in dealing with locality, climate, character and age of population, records of disease, and of marriages, births and deaths. The student of vitalities has before him material for assortment, and acquires, or ought to acquire, a skill which enables him to estimate its significance.

The science of statistics has very many notable names that have illustrated this acquired facility, and has predicated upon it principles and foretold results which have been justified by experience. Perhaps no man of this century has more fully exhibited this than Dr. Wm. Farr. In 1839 he was appointed superintendent of the statistical department of the Registrar-General's office, England, which included the decennial census and the vital returns for England and Wales. He brought to the service a mind of wonderful mathematical capacity, a professional knowledge of great exactness, and an enthusiasm of industry which made him diligent in his search for facts, and exact and expert in his methods of dealing with them. During his forty years of continuous service he was often under the fire of sharp and able criticism, and often for years had to be on the defensive as to propositions he made and theories that he claimed to have established. It is enough to know that his methods and conclusions are, to a large extent, accepted as fundamental bases to the sanitary legislation of England, and that vital statistics are always accounted as indispensable in making up the record and guide for methods of practical administration.

It is always to be borne in mind that the vital statistician does not claim his records as the only tests of the conditions of population. He of all others looks to the actual facts as to locality and surroundings, as to nationality and age, as to all social conditions, as to heredity and occupation. Indeed, while stating in figures or by diagram the marriage-rate or birth-rate or death-rate, he studies alongside of these all those modifying factors that come into the calculation.

No one can read such books as Quetelet or Todhunter on probabilities, or the collected papers of Wm. Farr on vital statistics, or such criticisms as those of Dr. Letheby, or Rumsey's essays and papers on some fallacies of statistics, without seeing how thoroughly the subject has been elucidated and tested, or upon what firm and tried foundations rest the principles of the science and the applications of the art. For instance, rules for supplying the acknowledged defects in returns have been so thoroughly tested that within prescribed limits it is shown that even in a large local failure, or in a more general incompleteness, from other facts it is possible to reckon the actual deficit. Even where such reckoning is not made there is a sense in which deductions secured from what are received are correct for the whole, just as it is, as a rule, safe to sample a year's crop of wheat in a single State by specimen bushels from every district. Even though some small district may not have furnished a fair sample, the aggregate for the whole State, either as to quantity or quality, would not be misleading. It is for this reason that great importance is to be attached to the combination of statistics secured on a uniform plan for long series of years, since thus the errors of small amounts are balanced or eliminated. Yet, for localities, as for streets of cities, there is need of an accurate record of population, of character of population, as to age, &c., and as to deaths and sickness each week, since these actual occurrences can often lead to rapid sanitary relief.

Experience has shown, as Mr. Humphrey, the editor of Dr. Farr's papers, states it, "That the death-rates in urban populations, at all ages, unless corrected for difference of age-distribution, invariably understate their real mortality; while, for the same reasons, the death-rates in rural districts, unless corrected, overstate their true mortality. * * * While, however, the uncorrected death-rate at all ages is, for comparative purposes, open to objections, death-rates at groups of ages are practically free from such objections."

HOW TO CALCULATE ESTIMATED POPULATIONS.

Inasmuch as it is the custom to state proportions of marriages, births and deaths by the number occurring in each thousand of the people, the question often arises as to the need of frequent estimate of population and the basis on which it is to be made. The general basis must certainly be a census taken, as nearly as possible, in a single day, or week, and with all possible exactness. As our census is a quinquennial one, we have some advantage over English and Continental methods, which have to be adjusted to a decennial count. We also, in this State, have a census of the number of dwellings, and thus have some additional facts as to the proximity of population. As the vital returns of this State are reckoned from July 1st, 1878, and as the times of census are 1880 and 1885, our quinquennials cross the period of the census, and are therefore more approximately correct as to proportions. There are other modifications which arise from the varying growth of particular cities or districts, or from the effects of the ingress of foreign population.

Instead, therefore, of presenting an estimated population for each year, it has been deemed best for the yearly State report to take the quinquennial returns as the basis for each half decade and decade, not, however, without keeping such condensed account of estimated population as will enable us to determine eventually when and how far such calculations for each locality would form a more correct estimate.

HOW TO ESTIMATE POPULATION.

It is, however, often important for localities, and especially for the larger cities, to be able to correct and estimate returns on the basis of an estimated population for each year. In these localities they are able to keep an account of many facts as to increase, such as the number of houses constructed and occupied and their character, the number of emigrants arriving, the increase in the voting population, and various other items that come into notice in a local way. They are also able more fully than a central authority to keep account of such deaths in institutions as should not be charged to the local account, except so far as they represent locality.

It needs also, however, to be borne in mind that as a rule, the statement of death-rate is more apt to fall short of the real number than to exceed it. Under the most perfect system some deaths will escape registration. From the traveling habits of our nation, and especially of our State, the frequent changes of residence, and the great use made of summer resorts, deaths often occur away from the place of residence and are returned to some other State or some sparser locality. Besides, by their absence from the insanitary condition of their city houses, many are saved from sickness and death, and so the death-rate fails to be a full index of the real evils. A careful noting of the course of vital events, leads us to believe that the State reports do not overstate the actual ratio of deaths to population. This is confirmed by comparisons of special localities for a series of years. The tendency which every locality has to report a low death-rate, often leads unconsciously to the allowing of greater significance to the facts that would reduce the proportion than to those that might increase it.

With the quinquennial records of the census as the basis, we herewith give suggestions or rules as to intermediate estimates.

The most general rule, and one applicable to country districts, or those not liable to sudden changes, is to add to the population of the last census a fifth of the difference between that and the preceding census for each intermediate year. Thus, for 1886 we would add a fifth of the difference between the census of 1880 and 1885. For 1887, 1888 and 1889, a fifth more respectively, leaving the census of 1880 to stand for that year. But for large populations this apportionment does not represent the rate of increase. In other words, it does not allow for the fact that, say, the 3,000 increase of 1886 is itself a new source of increase, and therefore will add for 1887 an increase of its own not expressed in the former division. To meet this, Dr. Farr had recourse to a logarithmic method which has been found available. It is thus illustrated: "Instead of taking the difference between the population enumerated in 1871 and 1881, the difference between the logarithm of those numbers affords the true method for ascertaining the *rate* of increase. Thus, the population of Sheffield for 1871 was 239,946, and had increased to 284,508 in 1881. The logarithm of the population of Sheffield in 1871 is 5.3801136, and that of the population of 1881 is 5.4540945. The difference between these logarithms is 0.0739809, which is the logarithm of the rate of increase of population in Sheffield during the ten years 1871–81. If this logarithm of the rate of increase be added to the logarithm of the population in 1881, the number corresponding to the new logarithm would be the estimate of the population at the census of 1891, which would, on this basis, be 337,346 (or 52.838 more than the enumerated population in 1881). (The other method would make the increase the same as in the previous decade—that is, 44,562 instead of 52,838 by the Registrar-General's method). Having obtained the logarithm of the ten years' increase (0.0739809), a tenth of this will give us the logarithm of the annual rate of increase; by inserting a cipher to the left of the logarithm we shall divide it by ten and 0.00739809. When once the annual rate of increase is obtained by logarithms, subsequent processes may be carried on by common arithmetic if preferred. For instance, the number to the logarithm of the actual rate of increase of population of Sheffield is 1.0170416, signifying that the rate of increase is equal to 1.70416 per cent. per annum."

As to proportions of sex, age and conjugal conditions, it has been found that these change so slowly that it may be assumed that the *proportions* found to exist at one census are maintained in the next. This is believed to be still more true at quinquennial intervals. Thus, the calculations in these regards for each year, if desired, are much simplified.

CLIMATOLOGY.

In order to afford data by which variation in diseases may be compared with variations in climate, the reports of this Board give the various climatological records in localities chosen as representative. In such a plan it is not needful to survey all the scope of the meteorologist, who studies the science which treats of the atmosphere and its phenomena, but rather deal with climate and causes which modify it in a particular place, or with weather as denoting different degrees of temperature, humidity, winds, cloudiness, rains, snows. While various facts appear in all the reports, attention is particularly called to the division Climatology in the fifth report, and to the article on "Comparative Facts in Climatology and Geology," in the sixth report, pages 269–284. It is to be remembered that climate is not the mere expression of atmospheric conditions, but has to do with distance from the equator, elevation, the distance from the sea or large bodies of water, prevailing winds, the character and contour of the geological structure and of the soil, the natural or artificial drainage, the amount of forests, the cultivation of the soil, the access of light and heat, &c.

As the geological structure and soil of New Jersey are so arranged as to admit of quite consecutive divisions, we have adhered as far as possible to the selection of localities representative of ground formation, and then associated with this a regard for varieties of location as to temperature, rainfall, &c.

Thus, at first, Newton, Sussex county, was taken to represent the Kittatinny valley and the sandstone, slate and adjacent rock, as well as our more northern and rocky country.

Paterson, located on trap-rock, well represents some slight variations from the same district, and the two mostly the azoic and paleozoic formation.

Newark represented the eastern boundary of the red sandstone section.

New Brunswick, Princeton and Trenton represent the western red sandstone section.

Freehold, amid the sand and clay marls, represents the cretaceous formation and the inland parts of Monmouth county.

Vineland shows us the tertiary formation, and the inland climate of the pine regions.

Cape May, so long as the Signal Service was maintained there, afforded evidence as to our lower Atlantic sea-coast.

Sandy Hook represents our northern Atlantic coast, and the mingling of sand and lower clay marls.

Sometimes, by reason of changes in observers or from other causes, we have added or substituted and used the facts to be gathered from New York city, Beverly, Philadelphia and Atlantic City. But we have always kept in view the character of geological structure and the comparison as to land and sea, mountain and plain, height above sea-level, and position of latitude.

For this year we give the same tables as formerly, with one or two variations. But as this is the first decennial of our vital statistics, we also combine in one result the testimony of the various localities for the ten years, and for each year of the ten, so as to admit of local and general comparisons with the records of deaths.

In order to secure an accurate reckoning of these data and their most efficient use, we have been aided by Capt. E. W. McGann, of the United States Signal Service, now stationed at New Brunswick. He has also the advantage of former observations in this State, and has, with skillful zeal, assisted in the work. His monthly bulletin on the weather for each month of our statistical year, from July 1st, 1887, to July 1st, 1888, will be found valuable.

While the beginning of a new decade will give us the opportunity to avail ourselves of some new observers and fuller data, we shall only seek to record the observations at eight or ten points as standards for comparison. It is equally important that the Local Boards of cities should study the relations of climate and weather to their weekly and quarterly returns of disease and death, so as to obtain information which will help them afterward in forestalling the sicknesses that are plainly affected by climatic conditions.

CONDENSED CLIMATOLOGICAL RECORDS FOR TEN STATISTICAL YEARS

Beginning July 1st, 1878, and ending July 1st, 1888.

STATION, NEWTON, N. J.

Latitude, 41° 2′ N.; Longitude, 74° 43′ W. Height of Barometer Cistern above Sea Level, 660 feet.

OBSERVERS, MISS E. FOSTER and MR. FOSTER, SR.

(FOR NINE YEARS.)	BAROMETER. Reduced to 32°.			THERMOMETER.				Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Mean.	Max.	Min.	Mean.	Max.	Min.	Absolute Range.						
1878-79	29.287	29.968	28.138	48.6	92.0	3.0	89.0	†75.5	S.W., N.W.	‡13.92	83	121	116
1879-80	......	......	......	54.0	96.0	5.0	91.0	......	S. W.	......	36	83	111
1880-81	29.167	29.997	28.832	48.9	95.0	5.0	90.0	68.3	S. W.	§15.89	......	99	151
1881-82	29.296	29.983	28.552	52.4	99.0	6.8	92.2	72.8	S. W.	43.74	......	139	141
1882-83	29.299	29.932	29.496	50.6	96.1	0.2	95.9	73.1	S. W.	41.68	......	129	124
1883-84	29.307	29.996	28.336	50.3	97.9	0.0	97.9	65.2	S. W.	41.25	36	140	113
1884-85	29.260	29.939	28.403	49.0	96.5	-5.0	101.5	65.2	S. W.	41.42	45	122	90
1885-86	29.224	29.976	28.082	50.8	100.0	-7.0	107.0	64.8	S. W.	51.74	41	142	91
1886-87	......	......	......	50.0	96.9	0.7	96.2	......	S. W.	‖32.46	......	120	97
Means	29.259	......	......	50.5	......	......	......	69.3	S. W.	......	191	121.3	115
Extremes	......	29.987	28.082	......	100.0	-7.0	107.0	......	......	......	......	......	......

* Including melted snow. † Mean for four months. ‡ Total for four months. § Total for six months. ‖ Total for nine months.

STATION, PATERSON, N. J.

Latitude, 40° 55′ N.; Longitude, 74° 11′ W. Height of Barometer Cistern above Sea Level, 142 feet.

OBSERVER, JOHN T. HILTON.

(FOR TEN YEARS.)	BAROMETER. Reduced to 32°.			THERMOMETER.				Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Mean.	Max.	Min.	Mean.	Max.	Min.	Absolute Range.						
1878-79	......	......	......	50.8	88.0	9.0	79.0	......	......	47.80	......	115	......
1879-80	......	......	......	54.3	98.0	5.0	93.0	......	......	45.32	......	110	......
1880-81	......	......	......	50.4	93.0	-6.0	99.0	......	......	83.48	......	114	......
1881-82	......	......	......	52.8	98.0	-5.0	103.0	......	......	62.69	......	130	......
1882-83	......	......	......	49.6	96.0	0.0	96.0	......	......	73.18	......	120	......
1883-84	......	......	......	50.9	97.0	5.0	92.0	......	......	43.20	......	117	......
1884-85	......	......	......	49.0	93.0	-4.0	97.0	......	S. W.	38.88	14	93	......
1885-86	......	......	......	52.3	96.0	0.0	96.0	......	S. W.	52.65	14	104	......
1886-87	......	......	......	51.4	89.0	16.0	73.0	......	......	41.68	20	102	......
1887-88	......	......	......	50.3	92.0	0.0	92.0	......	......	53.71	17	107	......
Means	......	......	......	51.2	......	......	92.0	......	......	54.26	16.2	111.2	......
Extremes	......	......	......	......	98.0	-6.0	104.0	......	......	83.48	......	118	......

* Including melted snow.

STATION, NEWARK, N. J.

Latitude, 40° 44′ N.; Longitude, 74° 10′ W. Height of Barometer Cistern above Sea Level, 35 feet.

OBSERVERS, W. A. WHITEHEAD and F. W. RICORD.

(FOR TEN YEARS.)	BAROMETER. Reduced to 32°.			THERMOMETER.				Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Mean.	Max.	Min.	Mean.	Max.	Min.	Absolute Range.						
1878–79	29.954	30.78	28.85	53.7	98.2	-2.0	100.2	....	N.W., S.W.	46.10	....	128	99
1879–80	30.057	30.70	28.85	53.4	99.2	8.0	91.2	....	N.W., S.W.	41.07	....	94	92
1880–81	30.022	30.85	29.17	49.2	96.0	-5.0	101.0	....	N.W., S.W.	47.95	....	115	92
1881–82	30.064	30.80	29.35	53.6	100.5	3.0	97.5	....	N.W., S.W.	36.82	....	118	73
1882–83	30.130	30.93	29.55	51.2	96.5	2.5	94.5	....	N. W.	51.82	....	110	149
1883–84	30.015	30.90	29.22	51.4	97.0	2.0	95.0	....	N. W.	46.05	....	104	225
1884–85	30.093	30.80	29.15	51.0	93.0	0.0	93.0	....	N. W.	39.27	19	90	126
1885–86	29.999	30.78	28.80	53.2	99.0	-2.0	101.0	....	N.W., S.W.	50.01	13	99	195
1886–87	29.998	30.96	29.20	52.5	94.0	5.5	88.5	....	N. W.	43.38	33	81	134
1887–88	30.050	30.90	29.31	51.5	96.0	2.3	93.7	....	N. W.	51.31	29	116	209
Means	30.037	....	....	52.1	....	....	95.6	....	N. W.	45.33	†23.5	105.5	139.6
Extremes	....	30.96	28.80	....	100.5	-5.0	101.0	....	....	51.82	33	128	225

* Including melted snow. † Mean for four years.

STATION, NEW BRUNSWICK, N. J.

Latitude, 40° 29′ N.; Longitude, 74° 27′ W. Height of Barometer Cistern above Sea Level, 115 feet.

OBSERVER, GEORGE H. COOK.

(FOR TEN YEARS.)	BAROMETER. Reduced to 32°.			THERMOMETER.				Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Mean.	Max.	Min.	Mean.	Max.	Min.	Absolute Range.						
1878–79	....	....	....	50.1	95.0	-8.0	103.0	....	W., S. W.	39.83	......	....	......
1879–80	....	....	....	52.8	98.0	5.0	93.0	....	W., S. W.	29.33	......	....	......
1880–81	....	....	....	48.7	95.0	-8.0	103.0	....	W., S.	44.93	......	....	......
1881–82	....	....	....	52.2	103.0	-3.0	106.0	....	W., S. W.	34.78	......	....	......
1882–83	....	....	....	47.9	95.0	3.0	92.0	....	E., W., S. W	49.12	......	....	......
1883–84	....	....	....	....	91.0	2.0	89.0	....	....	46.43	......	145	......
1884–85	....	....	....	....	90.0	2.5	87.5	....	....	38.14	......	128	......
1885–86	....	....	....	....	94.0	-1.0	95.0	....	....	47.13	......	128	......
1886–87	....	....	....	50.3	93.0	1.5	91.5	....	....	41.01	......	120	126
1887–88	....	....	....	49.9	96.5	-2.5	99.0	....	....	51.32	......	105	74
Means	....	....	....	†50.3	....	....	99.9	....	W., S. W.	42.20	......	125.2	100
Extremes	....	....	....	....	103.0	-8.0	111.0	....	....	51.32	......	145	......

* Including melted snow. † Mean of seven years.

STATION, SANDY HOOK, N. J.

Latitude, 40° 28′ N.; Longitude, 74° 0′ W. Height of Barometer Cistern above Sea Level, 28 feet.

OBSERVER, U. S. SIGNAL SERVICE.

(FOR EIGHT YEARS.)	BAROMETER.* Reduced to 32°.			THERMOMETER.				Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Mean.	Max.	Min.	Mean.	Max.	Min.	Absolute Range.						
1878-79	29.978	30.75	28.77	51.6	97.0	-3.0	100.0	73.7	W.	60.37	......	127	118
1879-80	30.044	30.77	29.33	55.2	96.0	10.0	86.0	72.6	S.W., N.W.	46.75	......	118	118
1880-81	29.994	30.80	29.02	50.6	92.0	-5.0	97.0	73.6	N. W.	53.14	......	126	102
1881-82	30.040	30.82	29.21	54.5	101.0	0.0	101.0	74.3	N. W.	46.20	......	140	95
1882-83	30.045	30.75	29.24	52.0	92.5	3.0	89.5	76.2	N. E., S. E.	48.23	......	124	88
1883-84	30.034	30.83	29.10	52.0	95.0	5.5	89.5	73.2	N. W.	48.42	......	143	89
1854-85	30.026	30.83	29.08	50.5	94.1	0.8	93.3	73.3	N. W.	41.33	......	134	83
1885-86	29.975	30.81	28.77	51.2	96.7	-2.2	98.9	79.4	N. W.	55.87	12	141	69
Means	30.017	......	......	52.2	......	......	......	74.5	N. W.	50.08	......	131.6	95.2
Extremes	......	30.83	28.77	......	101.0	-5.0	106.0	......	......	......	......	143	118

* Including melted snow.

STATION, BEVERLY, N. J.

Latitude, 40° 04′ N.; Longitude, 74° 55′ W. Height of Barometer Cistern above Sea Level, 40 feet.

OBSERVER, C. F. RICHARDSON.

(FOR FIVE YEARS.)	BAROMETER. Reduced to 32°.			THERMOMETER.				Mean Humidity.	Prevailing Wind.	Rain (inches).	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Mean.	Max.	Min.	Mean.	Max.	Min.	Absolute Range.						
1883-84	......	......	......	......	......	......	......	......	......	......	......	......	......
1884-85	......	......	......	......	......	......	......	......	......	......	......	......	......
1885-86	30.150	......	......	51.4	100.0	-4.0	104.0	*74.5	N. W.	50.98	......	117	......
1886-87	30.200	30.760	29.460	51.8	94.0	4.0	90.0	75.0	N. W.	40.52	......	124	154
1887-88	30.240	30.730	29.460	51.0	99.0	0.5	98.5	76.1	N. W.	47.22	15	122	160
Means	30.198	......	......	51.4	100.0	-4.0	97.5	75.2	N. W.	46.24	15	121	157

* For five months 1886. Means for three years.

STATION, VINELAND, N. J.

Latitude, 39° 29′ N.; Longitude, 75° 1′ W. Height of Barometer Cistern above Sea Level, 111 feet.

OBSERVERS, J. INGRAM, M.D., and O. H. ADAMS, M.D.

(FOR TEN YEARS.)	BAROMETER. Reduced to 32°.			THERMOMETER.				Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Mean.	Max.	Min.	Mean.	Max.	Min.	Absolute Range.						
1878-79	29.89	30.60	28.66	52.9	96.0	-4.0	100.0	76.4	S. W.	45.10	......	90	....
1879-80	29.91	30.59	29.01	57.1	97.0	10.0	87.0	73.0	S. W.	47.00	......	105	....
1880-81	29.84	30.60	28.88	50.0	98.0	-10.5	108.5	72.0	S. W.	59.99	......	102	....
1881-82	29.94	30.67	29.06	56.2	104.0	0.0	104.0	65.4	S. W.	40.59	......	99	....
1882-83	29.92	30.61	29.14	53.4	96.0	4.0	92.0	66.0	S.W., N.W.	54.11	......	108	....
1883-84	29.90	30.66	28.65	54.2	98.0	4.0	94.0	68.3	N. E., S.W.	56.79	......	116	159
1884-85	29.93	30.68	28.92	52.0	97.0	-4.0	101.0	73.4	S. W.	32.34	......	83	100
1885-86	29.88	30.68	28.82	53.0	100.5	-10.0	110.5	73.1	S. W.	43.99	......	89	102
1886-87	29.96	30.70	29.42	53.6	92.0	6.0	86.0	75.9	S. W.	44.98	......	86	94
1887-88	29.98	30.76	29.34	53.8	97.0	3.0	94.0	78.1	N. W.	49.21	......	80	83
Means	29.92	....	....	53.6	....	....	....	72.2	S. W.	47.41	......	95.8	†107.4
Extremes	....	30.76	28.65	....	104.0	-10.0	114.0	....	....	59.99	......	116	159

* Including melted snow. † Mean for five years.

STATION, CAPE MAY, N. J.

Latitude, 38° 56′ N.; Longitude, 74° 58′ W. Height of Barometer Cistern above Sea Level, 27 feet.

OBSERVER, U. S. SIGNAL SERVICE.

(FOR SEVEN YEARS.)	BAROMETER. Reduced to 32°.			THERMOMETER.				Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Mean.	Max.	Min.	Mean.	Max.	Min.	Absolute Range.						
1878-79	29.998	30.74	28.84	53.8	90.0	1.0	89.0	74.7	N. W.	42.44	......	116	103
1879-80	30.060	30.81	29.24	57.0	89.0	12.0	77.0	74.6	S.	50.91	......	125	106
1880-81	30.000	30.78	29.03	52.2	90.0	2.0	88.0	75.4	N. W.	60.54	......	144	139
1881-82	30.038	30.84	29.18	56.3	87.0	5.0	82.0	75.5	N. W.	40.37	......	144	125
1882-83	30.043	30.74	29.28	54.7	86.0	11.0	75.0	77.1	S.	54.83	......	127	78
1883-84	30.002	30.77	29.12	53.6	89.0	11.0	78.0	78.7	N. W.	47.79	......	135	86
1884-85	30.020	30.79	29.21	53.2	89.0	4.5	84.5	79.8	S.	40.83	......	113	74
Means	30.023	....	....	54.4	....	....	....	76.6	N. W.	45.39	......	129.1	100.
Extremes	....	30.84	28.84	....	90.0	2.0	89.0	....	....	60.54	......	144	139

* Including melted snow.
NOTE.—Station discontinued October, 1885.

STATION, ATLANTIC CITY, N. J.

Latitude, 39° 22′ N.; Longitude, 74° 25′ W. Height of Barometer Cistern above Sea Level, 34 feet.

OBSERVER, U. S. SIGNAL SERVICE.

(FOR FIVE YEARS.)	BAROMETER. Reduced to 32°.			THERMOMETER.				Mean Humidity.	Prevailing Wind.	Rain (inches).	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Mean.	Max.	Min.	Mean.	Max.	Min.	Absolute Range.						
1883-84	30.021	30.809	29.117	52.6	89.9	2.1	87.8	79.6	S. W.	53.70	......	137	99
1884-85	29.989	30.813	29.079	50.6	90.9	5.0	85.9	83.7	N. W.	38.40	......	116	56
1885-86	30.001	30.808	29.104	51.5	90.9	-2.3	93.2	82.3	S., N. W.	44.67	16	126	67
1886-87	30.051	30.947	29.153	52.1	91.5	7.0	84.5	83.0	S. W.	44.02	21	128	78
1887-88	30.039	30.860	29.180	50.6	97.0	10.0	87.0	83.0	N.W., S.W.	39.84	......	183	71
Means	30.020	....	....	51.5	....	....	87.7	82.3	S.W., N.W.	44.13	......	138	742
Extremes	....	30.947	29.079	....	97.0	-2.3	....	....	....	....	......	....	......

STATION, BARNEGAT, N. J.

Latitude, 39° 48′ N.; Longitude, 74° 9′ W. Height of Barometer Cistern above Sea Level, 20 feet.

OBSERVER, U. S. SIGNAL SERVICE.

(FOR SEVEN YEARS.)	BAROMETER. Reduced to 32°.			THERMOMETER.				Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Mean.	Max.	Min.	Mean.	Max.	Min.	Absolute Range.						
1878-79	29.996	30.76	28.80	50.6	94.0	-1.0	95.0	78.8	N. W.	49.38	......	148	91
1879-80	30.060	30.79	29.09	53.4	96.0	10.0	86.0	78.7	N. W.	47.27	......	153	107
1880-81	30.002	30.78	29.03	49.1	94.0	-7.0	101.0	78.6	N. W.	60.13	......	158	128
1881-82	30.045	30.82	29.12	53.0	96.0	-1.0	97.0	78.9	N. W.	58.85	......	139	118
1882-83	30.043	30.78	29.12	51.9	92.5	6.4	86.1	79.3	N. W.	59.78	......	143	110
1883-84	30.030	30.83	29.09	52.0	91.0	7.0	84.0	82.1	S. W.	32.54	......	158	103
1884-85	30.024	30.80	29.09	51.3	89.6	-0.2	89.8	80.8	N. W.	30.90	......	122	78
Means	30.029	....	....	51.6	....	....	....	79.6	N. W.	48.71	......	145.9	106.0
Extremes	....	30.83	28.80	....	96.0	-7.0	108.0	....	....	60.13	......	158	128

* Including melted snow.

NOTE.—Station discontinued December, 1885.

STATION, PATERSON, N. J.

Latitude, 40° 55′ N.; Longitude, 74° 11′ W. Height of Barometer Cistern above Sea Level, 84 feet.

OBSERVER, WILLIAM FURGASON.

	BAROMETER. Reduced to 32°.			THERMOMETER.			Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Max.	Min.	Mean.	Max.	Min.	Mean.						
1887.												
July				92	68	79			10.14		16	
August				89	57	74			4.62		7	
September				86	50	69			2.22		6	
October				74	40	53			2.56		4	
November				52	31	41			1.53		4	
December				46	9	29			5.53	2	9	
1888.												
January				44	0	23			6.24	7	8	
February				48	1	29			4.29	4	10	
March				64	10	38			4.17	4	8	
April				82	29	47			3.73		8	
May				84	43	59			6.62		21	
June				87	47	63			2.06		6	
For the year.						50.8			53.71	17	107	

* Including melted snow.

STATION, NEW YORK CITY, N. Y.

Latitude, 40° 43′ N.; Longitude, 70° 0′ W. Height of Barometer Cistern above Sea Level, 168 feet.

OBSERVER, U. S. SIGNAL SERVICE.

	BAROMETER. Reduced to 32°.			THERMOMETER.			Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Max.	Min.	Mean.	Max.	Min.	Mean.						
1887.												
July	30.20	29.62	29.97	94	66	77	74	S.	6.75		17	10
August	30.30	29.65	29.98	88	55	71	69	N.	3.66		7	6
September	30.46	29.54	30.10	84	41	63	69	N. W.	2.30		11	9
October	30.48	29.50	30.02	78	32	55	65	W., N.W.	2.66		9	10
November	30.77	29.40	30.04	67	23	44	61	N.W., W.	2.04	1	7	7
December	30.92	29.26	30.10	56	12	36	71	N. W.	4.20	8	14	12
1888.												
January	30.83	29.46	30.16	54	2	26	71	W.	5.14	10	14	10
February	30.60	29.49	30.08	55	3	32	77	W.	4.08	10	15	8
March	30.56	29.38	30.04	63	5	32	74	N. W.	5.64	7	15	11
April	30.56	29.58	30.11	84	29	48	68	W.	3.57	2	11	5
May	30.32	29.72	30.01	82	41	56	75	S.	4.87		21	16
June	30.24	29.68	29.93	96	52	71	70	S.	1.66		7	4
For the year.			30.045			51.1	69.9	W., N.W.	46.54	38	144	108

* Including melted snow.

STATION, NEWARK, N. J.

Latitude, 40° 44′ N.; Longitude, 74° 10′ W. Height of Barometer Cistern above Sea Level, 53 feet.

OBSERVER, F. W. RICORD.

	BAROMETER. Reduced to 32°.			THERMOMETER.			Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Max.	Min.	Mean.	Max.	Min.	Mean.						
1887.												
July	30.200	24.700	29.950	94	66	79.61	....	S. E., S. W.	7.050	....	15	16
August	30.290	29.750	30.020	92	55	73.14	....	N. W., S. W.	3.230	....	6	17
September	30.450	29.600	30.025	84	42	63.31	....	N. W., N. E.	2.300	....	8	13
October	30.480	29.570	30.025	76	30	54.51	....	N. W., S. W.	2.530	....	10	20
November	30.740	29.500	30.120	66	25	43.36	....	N. W., S. W.	2.080	2	6	18
December	30.900	29.310	30.105	57	13	34.92	....	N. W.	4.820	5	10	21
1888.												
January	30.820	29.470	30.145	54	3.30	24.89	....	N. W.	5.850	8	11	22
February	30.590	29.570	30.080	53	2.30	30.96	....	N. W., S. W.	4.290	6	7	16
March	30.540	29.440	29.990	60	4	32.71	....	N. W.	6.080	5	8	16
April	30.580	29.610	30.070	85	30	47.93	....	N. W., S. W.	4.050	3	8	15
May	30.330	29.770	30.050	83	40	59.72	....	N. E., S. E.	6.330	....	19	25
June	30.240	29.730	29.985	96	52	72.90	....	N. E., N. W.	2.700	....	8	10
For the year	....	....	30.047	....	....	51.50	....	N. W., S. W.	51.310	29	116	209

* Including melted snow.

STATION, NEW BRUNSWICK, N. J.

Latitude, 40° 29′ N.; Longitude, 74° 27′ W. Height of Barometer Cistern above Sea Level, 115 feet.

OBSERVER, PROF. GEO. H. COOK.

	BAROMETER. Reduced to 32°.			THERMOMETER.			Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Max.	Min.	Mean.	Max.	Min	Mean.						
1887.												
July	....	....	....	96.5	62.5	77.2	....	....	5.35	....	18	......
August	....	....	....	90.0	49.0	69.9	....	....	6.24	....	7	......
September	....	....	....	85.0	37.5	61.0	....	....	3.06	....	7	......
October	....	....	....	79.0	27.0	52.6	....	....	2.57	....	8	......
November	....	....	....	71.7	21.0	42.0	....	....	2.21	....	6	......
December	....	....	....	58.0	11.0	33.5	....	....	5.32	....	10	12
1888.												
January	....	....	....	58.0	-2.5	24.6	....	....	4.96	....	7	13
February	....	....	....	56.0	0.5	29.0	....	....	3.63	....	7	7
March	....	....	....	61.0	4.0	32.0	....	....	5.86	....	8	10
April	....	....	....	87.0	26.5	47.7	....	....	3.89	....	9	6
May	....	....	....	83.0	34.5	58.3	....	....	4.89	....	16	20
June	....	....	....	95.0	46.0	70.2	....	....	3.34	....	7	6
For the year	....	....	....	....	....	49.9	....	....	51.32	....	105	64

* Including melted snow.

STATION, BEVERLY, N. J.

Latitude, 40° 4′ N.; Longitude, 74° 55′ W. Height of Barometer Cistern above Sea Level, 40 feet.

OBSERVER, C. F. RICHARDSON.

	ANEROID BAROMETER.			THERMOMETER.			Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Max.	Min.	Mean.	Max.	Min.	Mean.						
1887.												
July	30.52	30.03	30.29	97	69	78.13	80.1	S. W.	9.48	....	15	12
August	30.49	30.04	30.25	88	55	71.21	79.0	N. W.	2.86	....	8	13
September	30.59	29.95	30.30	86	38	62.87	77.2	N. E.	5.27	....	8	13
October	30.50	29.76	30.19	81	28	53.13	73.7	N. W.	2.42	....	8	18
November	30.64	29.59	30.15	70	22	41.44	74.5	N. W.	1.66	....	6	12
December	30.73	29.46	30.18	59	13	33.83	81.2	N. W.	5.01	4	11	16
1888.												
January	30.66	29.66	30 18	58	5	26.09	78.8	N. W.	4.69	4	11	13
February	30.45	29.74	30.15	58	2	31.68	79.5	N. W.	2.55	4	13	13
March	30.54	29.59	30.11	69	7	33.87	76.4	N. W.	5.15	2	11	18
April	30.70	29.76	30.25	88	30	48.96	63.4	N. W.	1.89	1	7	5
May	30.46	29.91	30.20	87	31	59.96	77.2	N. W.	3.16	....	18	20
June	30.51	29.95	30.22	99	48	71.09	78.2	N. W.	3.08	....	6	7
For the year.	....	....	30.24	....	....	51 00	76.1	N. W.	47.22	15	122	160

* Including melted snow.

REMARKS.—First frost, September 17th, 1887; last frost, April 25th, 1888. One inch of snow April 16th.

STATION, PHILADELPHIA, PA.

Latitude, 39° 57′ N.; Longitude, 75° 9′ W. Height of Barometer Cistern above Sea Level, 117 feet.

OBSERVER, U. S. SIGNAL SERVICE.

	BAROMETER. Reduced to 32°.			THERMOMETER.			Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Max.	Min.	Mean.	Max.	Min.	Mean.						
1887.												
July	30.09	29.57	29.87	99.9	67.8	79.7	71.3	S.	7.14	....	11	11
August	30.19	29.62	29.89	90.1	56.3	73.0	68.9	N.	2.31	....	8	9
September	30.35	29.49	30.00	85.7	42.4	64.0	69.7	N.	4.92	....	12	12
October	30.38	29.41	29 93	84.2	30.6	55.6	66.3	W.	1.68	....	9	13
November	30.70	29.34	29.99	69.6	25.0	45 3	62 4	W.	1.38	....	7	8
December	30.81	29.22	30.02	58.9	14.5	36.9	71.4	N. W.	5.06	4	11	11
1888.												
January	30 70	29.49	30.07	56.2	2.4	28.0	71.4	N. W.	4.30	8	14	11
February	30.55	29.37	29.99	58.5	2.5	34.1	70.0	N. W.	2.57	8	12	7
March	30.44	29.24	29.95	70.0	8.2	35.1	67.1	N. W.	5.42	7	14	12
April	30.47	29.45	30.01	90.7	31.0	50.7	53.1	N. W.	2.10	1	8	6
May	30.18	29.59	29.89	86.6	42.5	60.6	70.4	N. W.	3 46	....	19	18
June	30.13	29.60	29.83	97.2	52.2	72.6	63.1	S.	1.09	....	5	5
For the year.	....	....	29.953	....	....	52 9	67.1	N. W.	41.43	28	130	123

* Including melted snow.

STATION, VINELAND, N. J.

Latitude, 39° 29′ N.; Longitude, 75° 1′ W. Height of Barometer Cistern above Sea Level, 110 feet.

OBSERVER, O. H. ADAMS, M.D.

	BAROMETER. Reduced to 32°.			THERMOMETER.			Mean Humidity.	Prevailing Wind.	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Max.	Min.	Mean.	Max.	Min.	Mean.						
1887.												
July	30.097	29.532	29.917	97	64	76.89	81.47	S. W.	8.706	....	6	6
August	30.679	29.651	29.873	89	50	74.20	80.29	N. E., S.W.	2.814	....	7	5
September	30.306	29.586	30.081	83	40	61.81	77.93	N. E., S.W.	5.196	....	5	8
October	30.336	29.541	29.957	80	30	55.26	79.33	S.W., N. E.	2.438	....	6	8
November	30.575	29.451	29.998	65	18	43.28	77.59	S. W.	2.028	....	6	6
December	30.761	29.338	30.045	59	15	37.38	79.29	W., N.W.	4.313	2	7	8
1888.												
January	30.627	29.527	30.126	54	3	30.42	76.28	N.W., S.W.	4.458	2	8	6
February	30.509	29.410	30.014	59	5	37 01	79.29	N.W., N.E.	2.517	3	8	9
March	30.411	29.572	30.017	69	8	40.97	77.16	N. W.	7.414	....	9	10
April	30.396	29.507	30.075	84	29	51.73	72.59	N.W., N.E.	2.661	....	7	5
May	30.183	29.648	29.912	83	37	60.60	77.56	N. E., S.W.	5.478	....	8	9
June	30.141	29.643	29.850	92	48	76.40	78.84	N. W.	1.190	....	3	3
For the year.	30.761	29.338	29.985	....	....	53.83	78.1	N. W.	49.212	7	80	83

* Including melted snow.

STATION, ATLANTIC CITY, N. J.

Latitude, 39° 22′ N.; Longitude, 74° 25′ W. Height of Barometer Cistern above Sea Level, 34 feet.

OBSERVER, U. S. SIGNAL SERVICE.

	BAROMETER. Reduced to 32°.			THERMOMETER.			Mean Humidity.	Prevailing Wind	Rain (inches).*	Snow (days of).	Days when Precipitation equaled 0.01.	Cloudy Days.
	Max.	Min.	Mean.	Max.	Min.	Mean.						
1887.												
July	30.21	29.66	30.00	97	65	75.3	87	S. E.	1.95	....	6	3
August	30.26	29.72	29.97	88	54	71.3	84	E.	3.08	....	18	2
September	30.43	29.63	30.10	78	40	63.4	87	N. E.	3.12	....	18	7
October	30.45	29.50	30.01	77	34	55.5	90	E., N. E.	3.39	....	11	14
November	30.72	29.44	30.05	64	23	44.0	90	N.	2.58	....	8	6
December	30.86	29.18	30.10	56	14	36.7	82	W.	4.51	....	14	7
1888.												
January	30.80	29.56	30.16	53	25	28.3	78	N. W.	3.96	....	13	6
February	30.62	29.48	30.07	56	27	33.2	80	N. W.	2.81	....	11	8
March	30.53	29.36	30.03	70	10	32.8	81	N. W.	4.15	....	13	7
April	30.56	29.54	30.10	74	30	45.9	74	S.	2.94	....	8	3
May	30.26	29.68	29.97	74	40	55.1	85	S.	4.02	....	13	7
June	30.22	29.67	29.91	90	56	66.6	78	S.	3.33	....	5	1
For the year.	....	....	30.039	....	....	50.6	83	N.W., S.W.	39.84	....	133	71

* Including melted snow.

METEOROLOGICAL SUMMARY FOR THE STATE.

July, 1887.

The month of July has surpassed all others for many years and will long be remembered for its excessive heat and humidity and its violent storms. Nearly every day for weeks the local papers have been telling of severe storms. The largest rainfall reported for the month was 15.29 inches, at Hightstown. On the 22d, 5.40 inches fell at Matawan, causing damage to the amount of $10,000. At Phillipsburg, Warren county, on the night of the 23d, a very severe thunder storm occurred. The lightning struck a smoke-stack on the Delaware Rolling Mill, and it fell against another high stack and both crushed in the roof over the hot furnace. A heavy shaft in the mill was also cut in two by the lightning. The Judd carriage factory, near by, was completely demolished. Hamlin's barn was blown over and four horses were buried in the ruins. A car loaded with ice, on the Lehigh Valley railroad, was blown down an embankment, and several houses in different parts of Phillipsburg were unroofed and many trees were uprooted. The damage, so far as known, will not be less than $20,000.

THE MEAN TEMPERATURE at ten stations, as compared with normals determined from past records of New York city, Atlantic City, Paterson, Newark, South Orange, Somerville, Moorestown, Philadelphia, Lambertville and New Brunswick, shows an excess of heat received during July of 3.8 degrees.

OPTICAL PHENOMENA.—*Auroras:* dates observed—Clayton, 20th; Moorestown, 18th; Egg Harbor City, 12th and 19th. *Lunar Halos*—Clayton, 24th and 30th; Beverly, 4th; Somerville, 7th, 8th, 27th and 28th; Locktown, 28th; New York city, 4th; Egg Harbor City, 25th and 29th. *Solar Halos*—Clayton, 24th; Beverly, 24th; Union, 9th; Paterson, 9th; Oceanic, 25th. *Meteors*—Beverly, 1st, 9th and 25th; Clayton, 7th.

August, 1887.

TEMPERATURE.—The mean temperature as compared with normals determined from past records of New Germantown, Newark, New Brunswick, Princeton, Lambertville, Trenton, Morrisville, Sandy Hook, Barnegat, Atlantic City, Freehold, Moorestown, Vineland, Greenwich and Cape May, shows a deficiency of heat received during the month of August of 1.26 degrees. The maximum recorded during the month was 94 degrees at Salem, on the 6th, and the minimum 42 degrees at Hanover, on the 27th. Fourteen stations report a maximum above 90 degrees and eleven report a minimum below 50 degrees.

RAINFALL.—The rainfall for the month was generally below the average. The heaviest rainfalls reported were as follows: New Brunswick, 4.62 inches; 4.50 inches of which fell between 1:58 and 3:15 P. M. of the 2d. At South Orange, on the 22d, 4.0 inches fell between 5 A. M. and 5 P. M. On the same date 2.12 inches were reported from Tenafly, 1.91 inches at Rancocas, 1.46 inches at Union, 1.24 inches at Philadelphia, 1.41 inches at New York city, 1.66 inches at Hightstown, 1.68 inches at Clayton, 1.13 inches at Beverly and 1.02 inches at Imlaystown. The storm on the 2d was confined to the counties of Middlesex and Morris.

Optical Phenomena.—*Auroras:* dates observed—Egg Harbor City, 13th and 16th. *Solar Halos*—Egg Harbor City, 7th, 9th, 12th, 13th, 18th and 19th; Union, 7th and 23d. *Meteors*—Dover, 8th, 9th and 12th; Beverly, 11th, 12th, 25th and 31st; Clayton, 12th. *Hail Storms*—Readington, 23d; Somerville, 22d; Beverly, 20th. *Polar Bands*—Beverly, 13th. *Light Frost*—Tenafly (lowlands), 26th; Beverly, 27th.

Thunder Storms.—Thunder storms were noted during the month of August as follows: Atlantic City, 1st, 6th, 11th, 12th, 20th, 22d and 30th; Beverly, 1st, 2d, 3d, 5th, 6th, 11th, 12th, 20th, 22d, 23d and 24th; Billingsport Light House, 6th and 24th; Bordentown, 11th, 20th, 22d and 24th; Clayton, 1st, 6th, 11th, 20th, 22d and 24th; Dover, 1st, 2d, 6th, 11th, 19th, 22d, 23d and 24th; Egg Harbor City, 6th, 20th and 24th; Harrisville, 1st, 6th, 11th, 15th, 20th, 22d, 23d, 24th, 30th and 31st; Hightstown, 11th, 22d, 23d and 24th; Imlaystown, 6th, 12th and 20th; Lambertville, 6th, 11th, 22d, 23d and 24th; Locktown, 6th, 11th, 22d, 23d and 24th; New York, 6th, 11th, 22d and 24th; Ocean City, 6th and 30th; Oceanic, 2d, 5th, 6th, 15th, 20th, 22d, 23d and 24th; Philadelphia, 6th, 11th, 20th, 22d and 24th; Rancocas, 6th, 11th, 22d, 23d and 24th; Readington, 6th, 11th, 22d, 23d and 24th; Salem, 6th, 22d and 23d; Somerville, 1st, 2d, 5th, 6th, 11th, 15th, 18th, 22d, 23d and 24th; South Orange, 2d, 11th, 19th, 22d, 23d and 24th; Tenafly, 1st, 2d, 3d, 12th and 21st; Union, 6th, 11th, 22d, and 24th (2); Moorestown, 1st, 2d, 6th, 11th, 18th, 19th, 20th, 21st, 22d, 23d and 24th.

September, 1887.

Atmospheric Pressure (in inches).—Monthly mean, 30.20; maximum observed, 30.63, at Egg Harbor City, on the 18th; minimum, 29.57, at Dover, on the 7th; range for State, 1.06; greatest local range, 0.24, at Dover, on the 6th; least local range, .00, at Egg Harbor, on the 11th.

Temperature (degrees F.)—Monthly mean, 61.6 degrees; highest monthly mean, 67.1 degrees, at Ocean City; lowest monthly mean, 57.8 degrees, at Locktown; maximum, 92.0 at Oceanic, on the 4th; minimum, 30.0 degrees, at Tenafly, on the 27th; range for State, 62.0 degrees; greatest local monthly range, 55.0 degrees, at Tenafly; least local monthly range, 37.9 degrees, at Atlantic City; greatest daily range, 41.0, at Tenafly, on the 9th, 18th, 19th; least daily range, 1.0, at Bordentown, on the 30th.

Precipitation—including melted snow (in inches).—Average for the State, 3.66; greatest, 6.25, at Rancocas; least, 1.62, at Gillette. *Wind*—Prevailing direction, northwest. *Thunder Storms*—7th, 12th and 30th. *Frost*—17th, 18th, 25th, 26th, 27th and 29th. *Solar Halos*—2d, 6th, 7th, 9th, 11th and 27th. *Lunar Halos*—4th, 9th, 26th and 27th. *Meteors*—17th, 18th, 19th, 21st, 25th and 26th. *Auroras*—9th and 18th.

Temperature.—The temperature for the month as compared with normals determined from past records of New Germantown, New Brunswick, Princeton, Lambertville, Trenton, Sandy Hook, Barnegat, Atlantic City, Freehold, Moorestown, Vineland, Greenwich and Cape May, shows a deficiency of heat received during the month of September of 4.6 degrees. The maximum recorded during the month was 92 degrees, at Oceanic, Monmouth county, on the 4th, and the minimum, 30 degrees, at Tenafly, Bergen county, on the 27th.

PRECIPITATION.—The rainfall for the month is generally below the average. The greatest monthly rainfalls reported were as follows: Rancocas, Burlington county, 6.25 inches; Imlaystown, Monmouth county, 5.92 inches; Toms River, Ocean county, 5.93 inches, and Egg Harbor, Atlantic county, 5.70 inches. The least monthly rainfalls (less than 2 inches) were reported from the counties of Essex and Morris.

October, 1887.

ATMOSPHERIC PRESSURE (in inches).—Monthly mean, 30.20; maximum observed, 30.65, at Egg Harbor City, on the 16th; minimum observed, 29.49, at Dover, on the 21st; range for State, 1.16; greatest local range, 0.32, at Beverly, on the 11th; least local range, 00.1, at Beverly, on the 2d.

TEMPERATURE.—Monthy mean, 52.3 degrees; highest monthly mean, 58.9 degrees, at Ocean City; lowest monthly mean, 46.5 degrees, at Rancocas; maximum, 89.0, at Clayton, on the 8th; minimum, 21.0 degrees, at Hanover, on the 31st; range for State, 68.0 degrees; greatest local monthly range, 63.2 degrees, at Egg Harbor City; least local monthly range, 3.8 degrees, at Ocean City; greatest daily range, 44.0, at Locktown, on the 18th; least daily range, 5.0, on the 28th.

PRECIPITATION—including melted snow (in inches).—Average for the State, 2.61; greatest, 5.0, at Ocean City; least, 1.58, at Princeton. *Wind*—Prevailing direction, northwest. *Polar Bands*—5th. *Hail*—25th. *Frost*—6th, 12th, 13th, 14th, 15th, 16th, 17th, 20th, 22d, 23d, 26th and 31st. *Solar Halos*—23d. *Lunar Halos*—23d, 25th, 28th, 29th and 30th. *Meteors*—6th, 7th, 13th, 15th and 17th.

TEMPERATURE.—The mean temperature for the month, as compared with normals determined from past records of Paterson, Newark, South Orange, New Germantown, Somerville, Princeton, Lambertville, Atlantic City, Moorestown and New Brunswick, shows a deficiency of heat received during the month of October of 0.8 degrees. The maximum recorded during the month was 89 degrees, at Clayton, Gloucester county, on the 8th, and the minimum 21 degrees, at Hanover, on the 31st.

PRECIPITATION.—The average rainfall for New Jersey for the month of October, 1887, 2.61 inches, was 1.10 inches below the October normal for many years. The greatest total monthly rainfall reported was 5.0 inches, from Ocean City, Cape May county, and the least monthly total, 1.58, from Princeton, Mercer county.

November, 1887.

ATMOSPHERIC PRESSURE (in inches).—Monthly mean, 30.125; maximum observed, 30.960, at Egg Harbor City, on the 30th. Minimum observed, 29.460, at Atlantic City, on the 19th. Range for State, 1.500; greatest local range, .502, at Dover, on the 10th; least local range, .02, at Lakewood, on the 18th and 24th.

TEMPERATURE (degrees F. 1).—Monthly mean, 41.5; highest monthly mean, 46.5, at Ocean City; lowest monthly mean, 38.3, at Dover; maximum, 72.0, at Harrisville and New Brunswick, on the 4th and 27th; minimum, 12.0, at Imlaystown, on the 30th. Range for State, 60.0; greatest local monthly range, 58.0, at Imlaystown; least local monthly range, 40.0, at Atlantic City; greatest daily range, 41.0, at Elizabeth, on the 5th; least daily range, 2.2, on the 20th, at Egg Harbor City.

PRECIPITATION—including melted snow (in inches).—Average for the State, 1.943; greatest, 2.60, at Egg Harbor City; least, 0.95, at Gillette. *Wind*—Prevailing direction, northwest. *Thunder Storms*—Distant lightning, 14th and 19th. *Hail*—1st and 11th. *Sleet*—1st and 11th. *Snow*—11th; (first of the season). *Frost*—1st, 2d, 3d, 4th, 6th, 9th, 11th, 14th, 16th, 18th, 21st, 22d, 23d, 29th and 30th. *Solar Halos*—4th, 7th, 14th and 18th. *Lunar Halos*—1st, 24th, 25th and 26th. *Meteors*—6th, 7th (3), 12th, 16th, 17th and 20th. *Auroras*—12th, at Oceanic.

December, 1887.

TEMPERATURE (degrees F.)—Monthly mean, 33.7; highest monthly mean, 38.5, at Ocean City; lowest monthly mean, 30.3, at Hanover; maximum, 63.0, at Ocean City, on the 4th; minimum, 6.0, at Hanover, on the 1st; range for State, 57.0; greatest local monthly range, 53.0, at Hanover; least local monthly range, 41.5, at Atlantic City; greatest daily range, 35.0, at Hanover, on the 28th; least daily range, 2.0, on the 15th, at Newark.

PRECIPITATION—including melted snow (in inches).—Average for the State, 5.29; greatest, 7.32, at Lambertville; least, 3.64, at Union. *Wind*—Prevailing direction, northwest. *Destructive Storms*—28th, near Oceanic, Monmouth county. *Sleet*—17th, 20th, 28th and 31st. *Snow*—1st, 2d, 18th, 20th, 24th, 26th, 28th and 31st. *Lunar Halos*—23d, 25th, 27th and 30th. *Meteors*—4th, 5th, 6th and 21st. *Auroras*—29th.

NOTE—The mean temperature, 33.7 degrees, is 1.1 degree above the December normal. The average precipitation, 5.29 inches, is 2.61 inches above the December average for the State.

January, 1888.

TEMPERATURE (degrees F.)—Monthly mean, 25.4; highest monthly mean, 29.2, at Ocean City; lowest monthly mean, 21.0, at Hanover; maximum, 59.0, at Freehold, on 2d and 15th; minimum, 12 below zero, at Tenafly, on the 23d; range for State, 71.0; greatest local monthly range, 67.0, at Tenafly; least local monthly range, 46.0, at Locktown; greatest daily range, 41.0, at Freehold, on the 16th; least daily range, 2.0, on the 3d, at Paterson and Oceanic.

PRECIPITATION—including melted snow (in inches).—Average for the State, 4.77; greatest, 6.74, at Paterson; least, 2.80, at Salem. *Wind*—Prevailing direction, northwest. *Hail*—Dates observed, 17th and 25th. *Sleet*—1st, 5th, 6th, 10th, 13th, 17th and 25th. *Snow*—3d, 4th, 9th, 13th, 15th, 17th, 18th, 20th, 21st, 23d, 25th, 26th, 27th and 31st. *Solar Halos*—23d and 25th. *Lunar Halos*—3d, 19th, 24th and 29th. *Auroras*—12th, 13th and 16th. *Meteor* observed—26th.

February, 1888.

TEMPERATURE (degrees F.)—Monthly mean, 30.6; highest monthly mean, 34.0, at Ocean City; lowest monthly mean, 27.1, at Hanover; maximum, 60.0, at Trenton, on the 20th; minimum, 5.0 below zero, at Tenafly, on the 16th; range for the State, 65.0; greatest local monthly range, 59.0, at Tenafly; least local monthly range, 48.0, at South Orange; greatest daily range, 43.0, at Tenafly, on the 2d; least daily range, 3.0, at Newark, Beverly and Clayton, on the 6th, 7th and 12th, respectively.

PRECIPITATION—including melted snow (in inches).—Average for the State, 3.53; greatest, 6.01, at Tenafly; least, 2.04, at Toms River. *Humidity*—Mean relative humidity, for the State, 76.5 per cent. *Wind*—Prevailing direction, northwest. *Thunder Storms*—At nearly all stations on the 20th.

MISCELLANEOUS PHENOMENA—dates observed.—*Hail*—11th and 18th. *Sleet*—4th, 7th, 10th, 11th, 12th and 18th. *Snow*—7th, 10th, 12th, 13th, 27th and 28th. *Solar Halos*—9th, 14th, 17th, 19th, 21st, 23d and 24th. *Lunar Halos*—3d, 19th, 21st, 22d and 24th. *Meteors*—14th and 22d. *Polar Bands*—3d, 9th, 21st and 28th. *Auroras*—9th.

March, 1888.

TEMPERATURE (degrees F.)—The average temperature for the month, 32.8, is 0.8 below the average for the corresponding month of 1887, and 4.2 below the normal of a great number of years. At Newark, the record makes the mean temperature of March for the last forty-four years, 37.4, which shows a deficiency of 4.7; highest monthly mean, 35.9, at Salem; lowest monthly mean, 30.2, at Union; maximum, 72.0, at Readington, on the 31st; minimum, 4.0 below zero, at Paterson, on the 13th; range for the State, 76.0; greatest local monthly range, 66.0, at Readington; least local monthly range, 56.0, at Newark; greatest daily range, 42.0, at Gillette, on the 20th; least daily range, 1.0, at Hanover, on the 16th; mean relative humidity, 79.8.

PRECIPITATION—including melted snow (in inches).—Average for the State, 5.71; greatest, 8.22, at Trenton; least, 3.75, at Salem. *Wind*—Prevailing direction of wind, northwest.

MISCELLANEOUS PHENOMENA—dates observed.—*Thunder Storms*—11th, 20th and 21st. *Hail*—12th, 21st and 25th. *Sleet*—1st, 2d, 4th, 11th, 24th and 25th. *Solar Halos*—10th, 16th, 17th and 18th. *Lunar Halos*—17th, 19th, 20th, 22d and 23d. *Meteors*—6th. *Polar Bands*—17th, 19th and 24th. *Auroras*—7th and 10th, Egg Harbor City.

April, 1888.

The mean temperature of the State for the month, determined from past records of twenty-nine stations, was found to be five-tenths of a degree above the mean. It was below the average until the 26th, when it rose at once to summer heat. On the 29th and 30th, several stations recorded 90, 91, 91.5 and 92 degrees respectively, which is the highest recorded, according to Mr. P. V. Spader's records, since April, 1861. The average rainfall for the State, 3.28 inches, shows a deficiency for the month of 0.65 inches.

TEMPERATURE (degrees F.)—Monthly mean, 47.9; highest monthly mean, 51.3, at Bridgeton; lowest monthly mean, 44.8, at Hanover; maximum, 92.0, at Tenafly, on the 29th; minimum, 22.0, at Tenafly, on the 25th; range for State, 70.0; greatest local monthly range, 70.0, at Tenafly; least local monthly range, 38.0, at Ocean City; greatest daily range, 47.0, at Tenafly and Bordentown, on the 28th; least daily range, 3.0, at Paterson, on the 18th.

PRECIPITATION—including melted snow (in inches).—Average for the State, 3.28; greatest, 4.68, at New Brunswick; least, 1.89, at Beverly. *Wind*—Prevailing direction, northwest.

MISCELLANEOUS PHENOMENA—dates observed.—*Thunder Storms*—5th, 6th and 18th. *Hail*—1st, 12th, 16th and 21st. *Sleet*—1st, 12th and 21st. *Snow*—16th and 21st. *Frost*—4th, 8th, 9th, 13th, 17th, 21st, 22d, 24th and 25th. *Solar Halos*—6th, 17th, 19th and 24th. *Lunar Halos*—15th, 17th, 22d and 23d. *Meteors*—26th. *Auroras*—11th, Princeton; 12th, Beverly.

May, 1888.

The extraordinary character of the month is shown by its record of cloudy and rainy days, and also in the comparative table of precipitation. It was a phenomenal month, and will hold a prominent place in the meteorological records of the State for years to come. The agriculturalist, too, will also have cause to remember it; it was so disastrous to the crops, especially to cherries, plums and peaches.

TEMPERATURE (degrees F.)—Monthly mean, 52.4; highest monthly mean, 63.0, at Bridgeton; lowest monthly mean, 55.1, at Atlantic City; maximum, 91.0, at Oceanic, on the 29th; minimum, 26.0, at Hanover, on the 3d; range for State, 65.0; greatest local monthly range, 59.0, at Locktown; least local monthly range, 30.0, at Ocean City; greatest daily range, 47.0, at Bordentown, on the 5th; least daily range, 2 0, at Oceanic, on the 23d.

PRECIPITATION—including melted snow (in inches).—Average for the State, 4.92; greatest, 6.48, at Egg Harbor City; least, 3.0, at Locktown. *Wind*—Prevailing direction, east.

MISCELLANEOUS PHENOMENA—dates observed.—*Thunder Storms*—5th, 9th, 10th, 11th, 12th, 14th, 16th, 28th, 29th and 30th. *Hail*—18th and 29th, at Union and Beverly, respectively. *Frost*—2d, 3d, 4th, 5th, 17th and 21st. *Polar Bands*—17th, at Beverly. *Solar Halos*—10th, 20th, 21st, 22d and 23d. *Lunar Halos*—17th, 19th, 21st, 22d and 23d. *Auroras*—2d and 20th.

June, 1888.

TEMPERATURE.—The mean temperature of the State, as compared with normals determined from past records of twenty-nine stations, was found to be one and one-tenth degrees above the mean. The maximum, 104 degrees, is probably the highest temperature recorded within the State during the month of June. Temperatures ranging from 94 to 104 degrees were recorded between the 21st and 25th, at all stations.

PRECIPITATION.—The average rainfall for the month, for the State, 2.59 inches, is 1.02 below the average, as determined from past records of twenty-nine stations. Seven stations report an excess, and twenty-two a deficiency. Two stations, Trenton and Toms River, report a total exceeding five inches, and five stations report a total of less than two inches.

ATMOSPHERIC PRESSURE (in inches).—Monthly mean, 29.940; maximum observed, 30.257, at Highland Park, on the 13th; minimum observed, 29.700, at Atlantic City, on the 1st; range for State, 0.557.

TEMPERATURE (degrees F.)—Monthly mean, 70.8; highest monthly mean, 75.0, at Bridgeton and Trenton; lowest monthly mean, 66.6, at Atlantic City; maximum, 104.0, at Tenafly, on the 23d; minimum, 38.0, at Bordentown, on the 5th; range for State, 66.0; greatest local monthly range, 6.40, at Tenafly; least local monthly range, 40.5, at Atlantic City; greatest daily range, 45.0, at Bordentown, on the 5th; least daily range, 1.0, at Paterson, on the 28th.

PRECIPITATION—including melted snow (in inches).—Average for the State, 2.59; greatest, 5.69, at Trenton; least, 1.67, at Bridgeton. ***Wind***—Prevailing direction, southwest.

MISCELLANEOUS PHENOMENA—dates observed.—*Thunder Storms*—6th, 10th, 14th, 15th, 16th, 17th, 18th, 21st, 23d, 24th, 25th, 26th, 27th, 28th, 29th and 30th. *Hail*—15th, 16th and 23d. *Solar Halos*—12th, 13th, 14th, 21st, 22d and 27th. *Lunar Halos*—19th and 21st. *Meteors*—12th and 19th. *Auroras*—2d, 3d and 5th. *Polar Bands*—17th, 19th and 30th.

DIVORCES IN NEW JERSEY FOR TEN YEARS.

In our first quinquennial report of vital statistics (see seventh report, 1883, of State Board of Health,) we gave a list of all the divorces of the previous five years, with specification of causes and the number, as granted by counties, together with the proportion they bore to the marriages. We also presented the facts as to the relation which these bear to vital statistics, and to the sanitary, social and moral interests of society. We refer to the article on this subject in that report, pages 325–329, for various facts and arguments, all of which cannot be repeated here. The alarming extent to which divorces had increased in some of the States has since led to a thorough investigation of the subject and to various discussions and legal provisions, with the view of limiting this tendency.

In Pennsylvania there had been, in one year, an average of one divorce to every ten marriages, and the same in Connecticut. Maine, Vermont, Rhode Island and Indiana approximated to the same proportions.

Dr. Woolsey, of New Haven, in a series of very able articles, brought his knowledge of international and national law to bear on the subject, and presented facts as to the bearing of this demoralization of the family relation upon the interests of the State and the nation, as well as upon general morality, so as to arouse the attention of statists and legislators.

Rev. Mr. Dike, now of Massachusetts, did similar service by extended correspondence and the facts which he elicited. He and others succeeded in forming an anti-divorce league, which pressed the matter upon the legislators of the afflicted States until some radical reforms have been made.

Fortunately, our own State had not fallen into the legal laxity of some of the surrounding States, which had made intemperance, cruelty, and almost any misconduct which "defeats the purposes of the marriage relation," a ground of application for divorce. With our courts, the testimony is taken before a Master in Chancery, and the Court of Chancery thoroughly scrutinizes the facts in evidence. No attempt is made to favor such privacy as will encourage application. Still, there is some need of guard in this State. The right to perform the marriage ceremony should not be given to too many classes of officers. Where neither party is known to the person performing the ceremony, and there is reasonable doubt as to age, the oath of the party or parties should not be sufficient, but should be attested by some friend accompanying. At any rate, all should be impressed with the fact that hasty and too youthful marriages always mean multiplication of divorces, and the divorces mean disrupted families and untrained children, too often becoming the dependents of the State.

There are good grounds for contending that we should have a national divorce law, since a marriage is often legal in one State that is not in another. So, as to divorce, we have all varieties of grounds, from that of "incompatibility and mutual diversion," in Illinois, to absolute prohibition in South Carolina, except by statute.

In this report we give the two quinquennial lists of divorces and then the combined decennial report, and compare it with the number of marriages which have taken place.

NUMBER OF DIVORCES GRANTED IN THE STATE OF NEW JERSEY, FOR A PERIOD OF FIVE YEARS, FROM JULY 1ST, 1878, TO JULY 1ST, 1883, IN YEARLY GROUPS.

YEAR.	Number Granted.	APPLICANTS.		CAUSES.					
		Husband.	Wife.	Adultery.	Desertion.	Extreme Cruelty.	Bigamy.	Impotence.	Near Relation.
1878–79...	144	59	85	60	78	3	1	2	...
1879–80...	149	51	98	56	86	6	...	1	...
1880–81...	137	50	87	52	79	2	2	1	1*
1881–82...	175	58	117	63	103	5	4	...	...
1882–83...	183	56	127	56	115	7	4	1	...
Totals...	788	274	514	287	461	23	11	5	1

* Married mother-in-law.

NUMBER OF DIVORCES GRANTED BY COUNTIES.

COUNTIES.	1878–79.	1879–80.	1880–81.	1881–82	1882–83.	Totals.	Population, Census of 1880.
Atlantic	...	1	1	4	6	12	18,704
Bergen	4	3	4	5	7	23	36,786
Burlington	5	7	5	5	7	29	55,403
Camden	9	6	7	7	11	40	62,942
Cape May	1	...	1	...	2	4	9,765
Cumberland	7	5	1	6	3	22	37,687
Essex	33	38	41	44	43	199	189,929
Gloucester	1	2	2	1	4	10	25,886
Hudson	28	30	17	34	35	144	187,944
Hunterdon	2	3	2	2	4	13	38,570
Mercer	9	6	6	17	10	48	58,061
Middlesex	9	6	5	3	8	31	58,286
Monmouth	5	7	10	5	6	33	55,538
Morris	4	2	5	4	4	19	50,861
Ocean	1	1	2	3	2	9	14,455
Passaic	9	14	14	16	12	65	68,860
Salem	1	...	1	...	4	6	24,579
Somerset	2	4	...	2	4	12	27,162
Sussex	1	1	1	2	1	6	23,539
Union	10	6	7	6	3	32	55,571
Warren	3	4	1	3	3	14	36,589
Out of State	...	3	4	6	4	17	....
Totals	144	149	137	175	183	788	1,131,117

SUMMARY OF MARRIAGES FOR FIVE YEARS, FROM JULY 1ST, 1878, TO JULY 1ST, 1883.

YEAR.	Marriages.	Supplement of each year.
1878–79	7,188	171
1879–80	7,935	227
1880–81	8,109	257
1881–82	8,837	745
1882–83	9,116	.....
	41,185 1,400	1,400
Total	42,585	

This gives a divorce-rate of 18.50 per 1,000 marriages, or 2,000 persons; or one divorce to every $54\frac{1}{24}$ marriages.

NUMBER OF DIVORCES GRANTED IN THE STATE OF NEW JERSEY, FOR A PERIOD OF FIVE YEARS, FROM JULY 1ST, 1883, TO JULY 1ST, 1888, IN YEARLY GROUPS.

YEAR.	Number Granted.	APPLICANTS.		CAUSES.					
		Husband.	Wife.	Adultery.	Desertion.	Extreme Cruelty.	Bigamy.	Impotence.	Near Relation.
1883–84...	220	80	140	81	130	5	3	1	...
1884–85...	213	73	140	81	122	8	2	...	...
1885–86...	231	93	138	79	143	5	4	...	...
1886–87...	240	84	156	86	142	7	5	...	...
1887–88...	269	99	170	95	161	9	3	1	...
Totals...	1,173	429	744	422	698	34	17	2	...

NUMBER OF DIVORCES GRANTED BY COUNTIES.

COUNTIES.	1883–84.	1884–85.	1885–86.	1886–87.	1887–88	Totals.	Population, Census of 1885.
Atlantic.........	2	4	4	5	4	19	22,356
Bergen..........	6	5	7	1	9	28	39,880
Burlington.....	6	8	4	7	12	37	57,558
Camden..........	19	13	24	20	29	105	76,685
Cape May......	...	1	...	1	...	2	10,744
Cumberland...	9	8	12	5	11	45	41,982
Essex...........	54	43	52	43	49	241	213,764
Gloucester......	2	4	4	1	5	16	27,603
Hudson	42	34	43	57	43	219	240,342
Hunterdon	2	3	4	9	1	19	37,420
Mercer...........	12	18	20	23	29	102	66,785
Middlesex	7	7	7	7	5	33	56,180
Monmouth	9	13	8	14	14	58	62,324
Morris	3	7	7	6	10	33	50,675
Ocean	2	2	2	2	1	9	15,586
Passaic...	22	12	18	17	15	84	83,374
Salem.....	5	3	1	1	2	12	25,373
Somerset........	4	7	2	6	3	22	27,425
Sussex..........	...	2	4	1	4	11	22,401
Union...........	8	12	3	9	15	47	61,839
Warren	4	3	4	3	5	19	37,737
Out of State...	2	4	1	2	3	12	....
Totals.........	220	213	231	240	269	1,173	1,278,033

SUMMARY OF MARRIAGES FOR FIVE YEARS, FROM JULY 1ST, 1883, TO JULY 1ST, 1888.

YEAR.	Marriages.	Supplement of each year.
1883–84	8,968	361
1884–85	8,989	359
1885–86	9,824	487
1886–87	11,567	223
1887–88	11,945	.....
	51,293	1,430
	1,430	
Total	52,723	

This gives a divorce-rate of 22.25 per 1,000 marriages, or 2,000 persons; or one divorce to every $45\frac{19}{20}$ marriages. Combining this with the table for the five years from July 1st, 1878, to July 1st, 1883, gives a divorce-rate of 20.58 per 1,000 marriages, or 2,000 persons; or one divorce to every $48\frac{3}{5}$ marriages for the ten years from July 1st, 1878, to July 1st, 1888.

NUMBER OF MARRIAGES, BIRTHS AND DEATHS BY TOWNSHIPS AND COUNTIES, AND TOTALS FOR THE STATE.

FOR THE YEAR ENDING JUNE 30, 1888.

ATLANTIC COUNTY.

	M.	B.	D.
Absecon	1	10	10
Atlantic City	152	199	233
Buena Vista	...	18	19
Egg Harbor City	23	45	37
Egg Harbor Township	22	89	65
Galloway	6	51	34
Hamilton	17	31	26
Hammonton	19	84	45
Mullica	4	6	14
Weymouth	1	9	9
	245	542	492

BERGEN COUNTY.

	M.	B.	D.
Englewood	85	67	67
Franklin	11	26	19
Harrington	12	33	37
Hohokus	10	39	33
Lodi	25	96	97
Midland	5	17	31
New Barbadoes	54	118	102
Orvil	10	18	32
Palisade	17	34	28
Ridgefield	22	96	91
Ridgewood	11	19	20
Saddle River	2	23	26
Union	10	55	78
Washington	12	51	37
	286	692	696

BURLINGTON COUNTY.

	M.	B.	D.
Bass River	5	18	15
Beverly	27	13	54
Bordentown	88	102	97
Burlington	101	89	165
Chester	23	59	52
Chesterfield	10.	18	22
Cinnaminson	28	72	41
Delran	6	81	48
Eastampton	2	15	6
Evesham	8	21	19
Florence	8	52	27
Little Egg Harbor	9	51	29
Lumberton	2	22	19
Mansfield	7	84	30
Medford	17	25	41
Mount Laurel	...	22	11
New Hanover	20	50	40
Northampton	54	81	185
Pemberton	4	26	72
Randolph	8	6	7
Shamong	...	11	12
Southampton	12	42	80
Springfield	5	27	26
Washington	...	6	10
Westampton	...	18	8
Willingboro	7	5	8
Woodland	1	2	2
	392	918	1,021

CAMDEN COUNTY.

	M.	B.	D.
*Camden City	4,936	1,111	1,205
Centre	8	60	44
Delaware	...	22	9
Gloucester City	83	150	133
Gloucester	13	70	75
Haddon	32	101	68
Stockton	35	86	127
Waterford	17	53	32
Winslow	16	32	34
	5,140	1,685	1,727

CAPE MAY COUNTY.

	M.	B.	D.
Cape May City	26	41	32
Dennis	11	31	27
Lower	10	50	31
Middle	11	42	43
Upper	17	34	13
	75	198	146

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* Marriages of non-residents, 4,080.

CUMBERLAND COUNTY.

	M.	B.	D.
Bridgeton	105	246	178
Commercial	21	70	18
Deerfield	11	34	20
Downe	18	33	8
Fairfield	8	15	23
Greenwich	6	20	14
Hopewell	14	30	37
Landis	67	152	120
Lawrence	13	21	32
Maurice River	21	51	37
Millville	95	303	191
Stoe Creek	1	23	8
	380	998	686

ESSEX COUNTY.

	M.	B.	D.
Belleville	27	85	63
Bloomfield	42	171	109
Caldwell	18	33	50
Clinton	10	54	35
East Orange	86	179	144
Franklin	9	32	37
Livingston	7	14	8
Millburn	10	43	34
Montclair	54	130	114
Newark	1,542	4,751	4,133
Orange	177	467	373
South Orange	25	82	57
West Orange	19	64	70
	2,026	6,105	5,227

GLOUCESTER COUNTY.

	M.	B.	D.
Clayton	18	41	48
Deptford	3	30	24
East Greenwich	6	24	25
Franklin	5	46	35
Glassboro	32	63	47
Greenwich	10	31	31
Harrison	8	33	25
Logan	7	32	19
Mantua	10	35	26
Monroe	13	18	57
South Harrison	1	14	12
Washington	8	28	14
West Deptford	5	28	20
Woodbury	47	92	86
Woolwich	13	62	28
	186	577	497

HUDSON COUNTY.

	M.	B.	D.
Bayonne	99	287	345
Guttenberg	4	59	43
Harrison	23	248	194
Hoboken	482	1,282	1,061
Jersey City	1,289	3,814	3,980
Kearny	14	117	74
North Bergen	26	88	220
Town of Union	161	251	208
Union	9	51	55
Weehawken	2	26	48
West Hoboken	76	270	218
	2,185	5,993	6,446

HUNTERDON COUNTY.

	M.	B.	D.
Alexandria	7	18	14
Bethlehem	23	33	43
Clinton	26	44	34
Delaware	32	49	41
East Amwell	8	15	32
Franklin	11	19	17
Frenchtown	29	24	10
High Bridge	14	33	23
Holland	20	28	31
Kingwood	4	28	18
Lambertville	56	81	57
Lebanon	25	54	25
Raritan	35	56	71
Readington	19	35	42
Tewksbury	14	53	20
Union	7	18	11
West Amwell	4	12	5
	339	584	494

MERCER COUNTY.

	M.	B.	D.
Chambersburg	92	228	169
East Windsor	25	60	49
Ewing	5	10	97
Hamilton	16	28	82
Hopewell	45	58	61
Lawrence	2	20	18
Millham	15	49	65
Princeton	29	55	65
Trenton	580	622	671
Washington	2	18	9
West Windsor	9	24	29
	820	1,172	1,315

MIDDLESEX COUNTY.

	M.	B.	D.
Cranbury	20	30	27
East Brunswick	28	75	57
Madison	8	20	21
Monroe	20	39	45
New Brunswick	125	381	352
North Brunswick	11	16	24
Perth Amboy	54	145	178
Piscataway	15	57	51
Raritan	28	56	58
Sayreville	14	15	16
South Amboy	30	96	76
South Brunswick	13	41	46
Woodbridge	22	72	50
	388	1,043	991

MONMOUTH COUNTY.

	M.	B.	D.
Atlantic	4	18	9
Eatontown	16	20	29
Freehold	52	77	110
Holmdel	9	8	20
Howell	35	58	40
Long Branch	51	181	108
Manalapan	10	22	38
Marlboro	8	35	24
Matawan	29	50	67
Middletown	28	67	102
Millstone	6	24	33
Neptune	70	106	128
Ocean	6	29	42
Raritan	29	90	110
Shrewsbury	78	112	149
Upper Freehold	17	51	50
Wall	39	119	82
	487	1,004	1,141

MORRIS COUNTY.

	M.	B.	D.
Boonton	17	45	58
Chatham	29	63	87
Chester	14	48	22
Hanover	16	46	115
Jefferson	2	22	19
Mendham	11	17	27
Montville	6	9	19
Morristown	51	178	166
Mount Olive	12	21	26
Passaic	7	11	82
Pequannock	16	40	35
Randolph	51	125	149
Rockaway	41	100	180
Roxbury	12	68	86
Washington	10	59	25
	295	852	941

OCEAN COUNTY.

	M.	B.	D.
Berkeley	...	13	13
Brick	28	53	48
Dover	30	44	38
Eagleswood	5	10	16
Jackson	9	25	14
Lacey	1	13	16
Manchester	6	13	11
Ocean	1	11	6
Plumsted	14	39	30
Stafford	9	15	13
Union	7	19	20
	110	255	225

PASSAIC COUNTY.

	M.	B.	D.
Acquackanonk	4	31	35
Little Falls	16	58	34
Manchester	6	23	26
Passaic	87	278	203
Paterson	769	1,833	1,719
Pompton	14	33	34
Wayne	3	27	23
West Milford	13	20	28
	912	2,303	2,102

SALEM COUNTY.

	M.	B.	D.
Alloway	11	18	23
Elsinboro	...	1	8
Lower Alloways Creek	8	15	15
Lower Penns Neck	7	9	15
Mannington	3	20	59
Oldmans	11	35	13
Pilesgrove	22	63	57
Pittsgrove	16	71	53
Quinton	6	23	16
Salem	68	98	103
Upper Penns Neck	24	55	35
Upper Pittsgrove	8	17	20
	184	425	417

SOMERSET COUNTY.

	M.	B.	D.
Bedminster	9	25	28
Bernards	22	31	45
Branchburg	3	6	19
Bridgewater	76	148	125
Franklin	16	45	50
Hillsborough	20	31	43
Montgomery	6	32	28
North Plainfield	28	86	66
Warren	5	10	18
	185	414	422

SUSSEX COUNTY.

	M.	B.	D.
Andover	6	23	10
Byram	13	32	15
Frankford	7	12	26
Green	4	10	4
Hampton	3	5	9
Hardyston	19	1	24
Lafayette	14	9	9
Montague	4	5	7
Newton	33	34	23
Sandyston	4	11	18
Sparta	10	13	32
Stillwater	13	15	15
Vernon	15	12	17
Walpack	2	6	3
Wantage	17	31	49
	164	219	261

UNION COUNTY.

	M.	B.	D.
Clark	...	4	6
Cranford	1	1	7
Elizabeth	281	894	758
Fanwood	5	19	12
Linden	4	12	48
New Providence	7	10	19
Plainfield	68	196	199
Rahway	68	125	140
Springfield	4	15	15
Summit	17	48	49
Union	5	27	41
Westfield	7	48	48
	467	1,394	1,342

WARREN COUNTY.

	M.	B.	D.
Allamuchy	1	5	11
Belvidere	41	35	38
Blairstown	16	20	17
Franklin	7	12	24
Frelinghuysen	6	14	14
Greenwich	10	16	22
Hackettstown	21	42	36
Hardwick	5	8	9
Harmony	18	21	18
Hope	11	25	22
Independence	5	7	12
Knowlton	93	22	27
Lopatcong	4	42	25
Mansfield	11	13	24
Oxford	87	111	94
Pahaquarry	3	....	3
*Phillipsburg	490	218	107
Pohatcong	7	18	17
Washington	43	77	62
	824	706	582

* Marriages of non-residents, 395.

TOTALS OF MARRIAGES, BIRTHS AND DEATHS FOR ALL THE COUNTIES.

	M.	B.	D.
Atlantic	245	542	492
Bergen	286	692	698
Burlington	892	918	1,021
Camden	5,140	1,685	1,727
Cape May	75	198	146
Cumberland	880	996	686
Essex	2,026	6,105	5,227
Gloucester	186	577	497
Hudson	2,185	5,993	6,446
Hunterdon	839	584	494
Mercer	820	1,172	1,315
Middlesex	878	1,048	991
Monmouth	487	1,004	1,141
Morris	295	852	941
Ocean	110	255	225
Passaic	912	2,898	2,102
Salem	184	425	417
Somerset	185	414	422
Sussex	164	219	261
Union	467	1,394	1,342
Warren	824	796	582
	16,025	28,074	27,178

RETURNS OF DEATHS FROM ALL CAUSES.

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1888—By Counties.

COUNTIES.	DEATHS AT ALL AGES.										PRINCIPAL CAUSES OF DEATH.																				
Statistical Divisions.	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Total, including undefined.	Population, census of 1885.	Death-rate per 1,000.	Death-rate per 1,000, without cities of over 5,000.	Deaths under five in each 100, or comparison of these with total deaths.	Comparative number deaths in each 100 from chief preventable diseases.	Remittent fever, &c.	Typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhoeal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accidents.
Atlantic	121	50	46	148	124	492	22,356	17.97	34.76	21.54	22 01	1	8	...	3	3	2	14	4	73	35	28	45	36	28	20	49	36	8	3	7	28
Bergen	147	74	67	216	190	698	39,880	....	31.66	25.50	17.50	6	17	...	17	1	2	49	4	82	37	37	74	35	57	23	64	43	15	7	12	48
Burlington	202	113	94	275	327	1,021	57,558	17.25	30.55	26.14	17.91	7	43	1	22	...	9	62	6	117	54	66	85	63	67	37	94	85	32	7	9	42
Camden	475	244	168	495	330	1,727	76,685	21.63	41.63	27.97	22.52	14	74	...	25	1	13	100	5	251	101	134	119	145	113	49	132	90	24	9	13	98
Cape May	17	15	9	46	58	146	10,744	....	21.92	19.18	13.59	3	8	...	3	3	......	9	......	3	5	11	10	10	8	2	29	13	6	......	......	4
Cumberland	153	97	65	163	200	686	41,982	13.73	36.44	26.24	16.34	4	14	...	3	4	1	73	2	79	47	51	70	36	38	24	56	44	25	4	7	16
Essex	1343	871	449	1647	902	5,227	213,764	15.83	42.36	27.45	24.45	55	92	...	44	12	25	456	26	725	396	300	604	476	294	229	367	249	118	21	41	215
Gloucester	117	64	59	120	137	497	27,603	....	36.42	27.77	18.01	2	9	...	24	1	3	38	3	58	28	32	42	28	44	10	41	35	11	2	7	19
Hudson	1735	1060	608	2191	840	6,446	240,342	31.59	43 36	28.54	26.82	74	159	...	140	32	34	473	26	902	423	344	860	568	345	213	355	283	115	29	58	351
Hunterdon	77	39	31	125	219	494	37,420	....	23.48	14.57	13.20	5	10	...	2	...	3	24	2	26	25	41	51	21	52	19	80	31	19	3	4	18
Mercer	328	156	111	408	298	1,315	66,785	19.91	36.81	26.39	19.69	9	20	...	4	4	23	114	8	165	102	86	125	67	66	53	126	73	20	7	16	68
Middlesex	195	147	108	279	245	991	56,180	14.74	34 51	28.36	17.64	13	30	...	10	...	4	101	4	119	54	60	106	52	66	38	61	51	32	5	11	72
Monmouth	232	146	141	306	299	1,141	62,324	18.44	33.13	27.26	18.31	9	21	...	28	3	6	92	7	145	53	66	107	54	98	56	106	79	31	7	16	44
Morris	179	109	122	246	281	941	50,675	18.49	30.61	28.80	18.57	9	13	1	11	...	5	105	7	120	47	51	76	32	61	30	135	62	27	6	6	49
Ocean	39	23	23	69	71	225	15,586	....	27.56	24.89	14.44	1	13	...	2	1	4	10	2	23	15	17	19	13	17	11	14	16	8	1	5	10
Passaic	542	402	212	600	328	2,102	83,374	15.29	44.91	30.07	25.34	20	30	...	181	4	1	118	9	269	134	121	216	185	120	73	101	101	35	8	32	83
Salem	78	47	49	96	141	417	25,373	15 81	29 98	23.02	16.43	3	9	...	6	...	2	31	3	42	19	32	40	21	32	16	39	29	10	3	8	10
Somerset	72	46	34	115	155	422	27,425	....	27.96	22.04	15.39	2	2	...	11	...	1	19	5	53	25	29	39	13	35	27	54	28	12	1	4	21
Sussex	39	19	17	73	111	261	22,401	....	22.22	15.71	11.65	......	9	...	2	3	2	4	......	21	22	14	25	9	28	11	35	17	10	2	1	14
Union	334	180	131	390	304	1,342	61,839	17.57	38.30	27 27	21 86	20	28	3	8	2	19	108	5	173	68	75	157	86	78	51	108	73	36	10	5	76
Warren	109	72	61	151	187	582	37,737	16.00	31 10	25.09	15.42	7	11	...	28	...	2	36	......	62	33	40	52	21	44	28	49	38	18	7	9	34
Totals	**6534**	**3974**	**2605**	**8162**	**5747**	**27,173**	**1,278,033**	**17.01**	**38 67**	**27.12**	**21.26**	**261**	**620**	**5**	**574**	**74**	**161**	**2036**	**128**	**3506**	**1723**	**1636**	**2922**	**1971**	**1691**	**1020**	**2095**	**1476**	**612**	**142**	**271**	**1320**

Of those dying under one year, 1,770 died under one month, of which 1,213 died in the large cities. Of those dying under one year, 4,614 died in the larger cities. Of the 10,508 that died under five years, 7,455 died in the larger cities. Total death-rate from consumption for the State, as compared with the total death-rates, 12.44, the deaths being 2,236 in cities, 1,122 outside. Rates for short periods, or which deal with small numbers, are only approximate, since temporary causes may have been in operation, and small numbers do not eliminate or balance errors which practically disappear in large aggregates. The number of deaths before twenty, in proportion to the rest, is much more informatory as to local causes affecting health than the total deaths. See, also, the number dying from communicable diseases.

Return of Deaths from all Causes and Certain Specified Diseases, in the Cities of the State of New Jersey, of over 5,000 Population, for the Year ending June 30th, 1888.

CITIES HAVING OVER 5,000 POPULATION. Statistical Divisions.	DEATHS AT ALL AGES.						Population, census of 1885.	Death-rate per 1,000.	Deaths under five in each 100, or comparison of these with total deaths.	Comparative number of deaths in each 100 from chief preventable diseases.	PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Total, including undefined.					Remittent fever, &c.	Typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Atlantic County.																															
Atlantic City	67	22	27	74	41	233	7,912	29.34	38.20	23.61	......	2	...	1	....	1	7	1	43	17	13	16	22	14	14	24	14	3	3	4	11
Burlington County.																															
Bordentown	15	4	7	39	32	97	5,857	16.56	19.55	15.46	1	3	...	......	....	1	......	1	9	6	14	6	4	7	7	8	10	4	1	....	5
Burlington City ...	34	21	17	43	47	165	7,690	21.46	33.33	35.15	3	6	...	......	....	......	27	...	22	10	6	8	11	13	5	9	18	6	1	1	9
Camden County.																															
Camden City	361	167	113	355	202	1,205	52,884	22.79	43.82	29.29	11	55	...	13	1	8	73	5	187	72	90	82	104	71	37	82	56	16	6	6	69
Gloucester City.....	22	25	19	43	28	138	5,966	23.13	34.71	24.64	1	6	...	4	....	......	11	...	12	10	17	6	12	9	2	12	8	1	1	3	10
Cumberland County.																															
Bridgeton.............	39	23	18	47	45	178	10,065	17.69	34.82	25.28	1	5	...	1	2	......	10	...	26	9	15	23	13	13	5	15	9	7	......	....	8
Millville	50	44	30	33	34	191	8,824	21.65	49.21	46.07	......	4	...	......	....	......	53	1	30	7	11	16	3	11	6	10	13	3	1	1	1
Essex County.																															
Newark	1107	703	372	1286	665	4,133	152,988	27.02	43.79	28.38	41	76	...	34	10	19	397	20	576	327	230	483	398	218	163	261	180	94	16	32	163
Orange..................	88	57	26	145	55	373	15,231	24.49	38.88	24.66	5	4	...	1	1	2	17	1	61	32	17	48	21	20	24	31	28	8	2	4	19
Hudson County.																															
Bayonne	128	65	34	89	28	345	13,080	26.38	56.52	31.88	11	6	...	1	6	4	28	2	52	7	14	54	37	14	11	9	9	2	3	6	28
Harrison	51	30	21	59	33	194	6,806	28.50	41.75	31.96	6	9	...	1	3	......	14	1	28	12	7	24	25	4	5	11	9	4	......	4	10
Hoboken	294	176	95	397	99	1,061	37,721	28.13	44.29	28.37	4	15	...	13	8	......	76	4	181	88	46	128	95	68	39	51	42	20	4	6	59
Jersey City...........	1049	661	377	1363	525	3,980	153,513	25.93	42.96	28.24	43	114	...	119	10	25	285	15	513	247	226	519	338	206	134	231	178	69	19	39	204
Town of Union....	59	37	19	66	27	208	8,398	24.77	46.15	36.06	2	6	...	4	1	1	20	1	40	17	10	27	13	11	4	6	12	8	......	2	8
Mercer County.																															
Chambersburg......	68	24	13	48	15	169	8,542	19.78	54.44	36.09	......	1	...	......	2	5	15	...	38	15	5	16	14	7	4	9	4	5	......	3	5
Trenton	185	93	58	179	140	671	34,386	19.51	41.43	29.51	5	11	...	4	1	15	67	6	89	47	41	74	33	32	27	48	36	7	5	7	31
Middlesex County.																															
New Brunswick....	59	54	46	99	87	352	18,258	19.28	32.10	30.97	3	14	...	......	....	1	50	1	40	19	16	26	17	24	18	23	27	13	......	4	22
Perth Amboy.......	49	40	22	43	18	173	6,311	27.41	51.45	38.73	3	3	...	1	....	1	31	1	27	7	7	20	12	7	4	6	4	4	2	1	10
Monmouth County.																															
Long Branch........	24	15	13	32	18	103	5,140	20.04	37.86	31.07	......	2	...	1	....	1	15	1	12	2	3	6	6	7	4	11	11	2	......	2	3
Morris County.																															
Morristown...........	32	16	17	41	59	166	8,760	18.95	28.92	27.11	1	1	1	......	....	......	13	...	29	6	12	9	5	8	13	24	14	6	......	2	6
Passaic County.																															
Passaic City..........	65	38	23	45	32	203	8,326	24.38	50.74	35.96	3	7	...	2	1	......	15	...	45	10	6	23	19	9	6	13	10	2	3	2	6
Paterson	434	345	169	506	249	1,719	63,273	27.17	45.32	30.38	13	21	...	172	3	1	97	9	205	112	108	170	154	97	60	79	81	28	5	28	65
Salem County.																															
Salem City.............	25	9	12	23	32	103	5,516	18.85	33.01	25.24	2	7	...	3	....	1	1	...	12	7	8	8	3	13	4	9	6	....	1	....	1
Union County.																															
Elizabeth	200	116	79	235	127	758	32,119	23.28	41.69	30.84	14	12	3	2	1	14	77	4	103	37	40	81	51	44	37	52	39	13	3	5	47
Plainfield...............	53	31	13	54	48	199	8,913	22.31	42.21	29.15	......	3	...	1	....	2	16	...	36	18	9	22	11	11	12	18	7	12	1	....	8
Rahway..................	29	13	10	43	45	140	6,861	20.41	30.00	17.86	1	5	...	3	....	2	3	...	11	5	12	17	13	10	3	17	9	3	1	....	10
Warren County.																															
Phillipsburg	27	12	12	29	27	107	8,058	13.28	36.45	28.04	2	1	...	2	....	1	7	...	17	3	9	5	6	6	5	15	9	3	......	....	7
Totals	4614	2841	1662	5426	2748	17,364	701,428	24.76	42.94	29.14	176	399	4	383	50	106	1425	74	2444	1144	992	1947	1,440	954	643	1,084	843	343	78	162	820

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1888.

ATLANTIC COUNTY. POPULATION, 22,356. Statistical Divisions.	DEATHS AT ALL AGES.						Population, census of 1885.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Total, including undefined.			Remittent fever, &c.	Typhoid fever.	Small-pox.	Scarlet fever.	Measles	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Absecon	2	1	1	3	3	10	567	......	......	......	......	......	......	......	......	......	4	......	1	......	......	......	......	1	1	......	......	......	1
*Atlantic City	67	22	27	74	41	233	7,942	29.34	......	2	......	1	......	1	7	1	43	17	13	16	22	14	14	24	14	3	3	4	11
Buena Vista	1	......	5	6	7	19	1,016	......	......	2	......	......	......	1	2	1	......	3	1	3	......	2	......	......	......	......	......	......	1
Egg Harbor City	11	2	1	11	12	37	1,317	......	......	......	......	......	......	......	......	......	5	2	2	2	2	4	......	2	3	2	......	2	2
Egg Harbor Township	17	11	3	19	15	65	3,919	......	......	1	......	......	1	......	......	......	10	5	6	8	8	2	4	6	5	1	......	1	2
Galloway	5	......	2	14	13	34	2,153	......	1	1	......	......	......	......	......	......	1	5	3	3	1	1	1	4	5	1	......	......	3
Hamilton	4	3	2	6	11	26	1,484	......	......	2	......	......	......	......	1	1	2	1	......	3	2	1	......	4	3	......	......	......	2
Hammonton	11	8	3	10	12	45	2,525	......	......	......	......	1	2	......	2	1	4	......	1	9	......	3	1	4	2	1	......	......	4
Mullica	2	1	......	4	7	14	807	......	......	......	......	......	......	......	......	......	2	2	......	......	1	......	......	4	2	......	......	......	2
Weymouth	1	2	2	1	3	9	626	......	......	......	......	1	......	......	2	......	2	......	1	1	......	1	......	......	1	......	......	......	......
Totals	121	50	46	148	124	492	22,356	22.01	1	8	......	3	3	2	14	4	73	35	28	45	36	28	20	49	36	8	3	7	28

*This and all other cities that are health resorts have an excessive death-rate by reason of temporary increase of population, which also includes a proportion of invalids above the average. Local Boards show this on their record.

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1888.

BERGEN COUNTY. POPULATION, 39,880. Statistical Divisions.	DEATHS AT ALL AGES.						Population, census of 1885.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Total, including undefined.			Remittent fever, &c.	Typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Englewood	16	7	4	21	19	67	4,429	......	......	......	......	3	......	......	3	......	10	7	4	8	1	6	1	6	3	3	1	2	4
Franklin	3	2	3	4	7	19	2,194	......	......	......	......	1	......	......	......	......	1	3	1	2	2	1	......	2	2	......	......	......	......
Harrington	5	8	1	13	10	37	2,604	......	1	......	......	1	......	......	3	......	2	1	2	6	1	6	2	4	1	2	......	1	......
Hohokus	8	1	5	10	14	38	2,898	......	1	2	......	2	......	......	1	......	4	1	3	2	2	2	1	7	5	3	......	1	......
Lodi	29	13	12	24	17	97	4,347	......	1	3	......	......	......	......	13	1	16	5	2	10	10	5	1	5	5	2	......	......	6
Midland	5	4	2	6	14	31	1,617	......	1	2	......	1	......	......	1	......	4	......	......	2	2	1	3	5	3	1	2	......	1
New Barbadoes	24	11	13	25	29	102	4,983	......	1	4	......	3	......	......	5	......	14	2	5	18	5	9	3	9	1	1	1	2	6
Orvil	......	3	3	16	9	32	......	......	......	......	......	2	......	......	3	......	......	1	2	4	......	3	......	2	3	......	......	......	12
Palisade	4	1	4	11	8	28	2,333	......	......	......	......	......	......	1	3	......	......	1	3	2	......	5	......	5	1	......	......	1	1
Ridgefield	17	10	8	32	24	91	4,487	......	......	3	......	2	1	......	6	......	8	4	6	6	6	8	......	8	9	......	1	3	10
Ridgewood	7	1	1	7	4	20	1,776	......	......	1	......	1	......	......	......	......	4	......	......	2	2	......	1	3	1	1	1	......	......
Saddle River	7	3	1	11	4	26	1,584	......	......	......	......	......	......	......	2	......	3	3	......	3	2	1	1	1	1	......	......	......	6
Union	17	10	6	24	15	73	5,914	......	1	......	......	......	......	1	9	2	13	6	4	5	2	3	6	5	5	2	1	2	2
Washington	5	......	4	12	16	37	2,714	......	......	2	......	1	......	......	......	1	3	3	5	4	......	7	4	2	3	......	......	......	......
Totals	147	74	67	216	190	698	39,880	17.50	6	17	......	17	1	2	49	4	82	37	37	74	35	57	23	64	43	15	7	12	48

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1888.

BURLINGTON COUNTY. POPULATION, 57,558. Statistical Divisions.	DEATHS AT ALL AGES. Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Total, including undefined.	Population, census of 1885.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH. Remittent fever, &c.	Typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Bass River	4	......	1	5	5	15	905	......	......	......	......	......	......	......	1	......	......	1	2	......	1	1	......	1	2	......	......	1	1
Beverly	15	3	3	18	15	54	3,356	......	......	3	......	1	......	3	1	......	7	2	4	2	4	6	1	3	4	......	1	......	3
Bordentown	15	4	7	39	32	97	5,857	16.56	1	3	......	......	......	1	......	1	9	6	14	6	4	7	7	8	10	4	1	......	5
Burlington	34	21	17	43	47	165	7,690	21.46	3	6	......	......	......	......	27	......	22	10	6	8	11	13	5	9	18	6	1	1	9
Chester	10	1	1	18	22	52	3,071	......	......	......	......	......	......	......	1	......	3	7	2	7	4	3	4	4	5	4	......	1	1
Chesterfield	4	4	......	3	11	22	1,453	......	......	......	......	1	......	......	......	......	5	......	1	3	1	......	1	3	3	......	1	......	......
Cinnaminson	9	8	2	18	4	41	2,640	......	......	2	......	......	......	2	......	1	7	2	3	2	4	3	3	3	1	4	1	1	1
Delran	12	9	6	7	9	43	1,932	......	......	1	......	......	......	......	8	1	6	1	2	4	3	2	2	4	1	2	......	......	1
Eastampton	......	1	......	2	3	6	655	......	......	1	......	1	......	......	......	......	......	1	......	......	......	1	......	......	......	1	......	......	......
Evesham	4	2	2	4	7	19	1,556	......	......	1	......	......	......	......	......	......	4	......	1	2	1	1	1	5	1	......	......	......	......
Florence	4	4	4	3	12	27	1,582	......	......	2	......	......	......	......	......	......	1	1	2	3	4	1	3	3	1	1	......	......	3
Little Egg Harbor	7	4	7	3	7	29	1,885	......	......	......	......	......	......	1	6	......	3	1	2	3	1	2	......	4	......	1	......	......	......
Lumberton	8	4	1	2	3	19	1,735	......	......	2	......	1	......	......	......	......	6	1	......	1	2	2	......	......	......	......	......	......	3
Mansfield	2	3	3	10	12	30	1,715	......	......	3	......	2	......	......	1	......	1	......	1	3	1	3	......	4	4	......	......	2	1
Medford	7	1	......	12	21	41	2,064	......	1	1	......	......	......	......	......	......	3	......	5	4	2	4	3	10	2	2	......	......	......
Mount Laurel	1	2	1	1	5	11	1,781	......	......	1	......	1	......	......	......	......	......	1	1	3	......	......	......	1	......	......	1	......	1
New Hanover	13	6	3	5	13	40	2,235	......	......	2	......	1	......	2	......	......	6	2	1	5	4	3	1	4	3	1	......	......	1
Northampton	26	18	17	38	35	135	5,006	......	......	9	1	13	......	......	1	1	20	6	10	14	8	3	2	15	8	3	......	1	5
Pemberton	8	7	4	21	31	72	2,944	......	2	3	......	......	......	......	1	1	5	8	4	7	2	5	2	4	10	1	......	2	3
Randolph	2	......	......	1	4	7	365	......	......	......	......	......	......	......	......	......	......	......	......	1	......	1	......	......	3	......	......	......	......
Shamong	2	......	......	7	3	12	933	......	......	......	......	......	......	......	......	......	......	2	......	2	......	......	......	1	3	......	......	......	1
Southampton	5	3	9	4	7	30	2,263	......	......	......	......	1	......	......	9	......	3	......	2	3	3	1	1	3	......	1	......	......	1
Springfield	6	1	3	6	10	26	1,884	......	......	2	......	......	......	......	1	......	4	......	1	......	1	3	......	3	4	......	......	......	1
Washington	2	2	......	......	6	10	333	......	......	1	......	......	......	......	......	......	1	1	1	2	1	1	......	......	2	......	......	......	......
Westampton	1	3	1	3	......	8	688	......	......	......	......	......	......	......	3	......	1	1	......	......	......	1	......	......	......	......	1	......	......
Willingboro	......	2	2	2	2	8	725	......	......	......	......	......	......	......	2	1	......	......	1	......	1	......	1	1	......	......	......	......	1
Woodland	1	......	......	......	1	2	305	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	1	......	1	......	......	......
Totals	202	113	94	275	327	1,021	57,558	17.91	7	43	1	22	......	9	62	6	117	54	66	85	63	67	37	94	85	32	7	9	42

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1888.

CAMDEN COUNTY. POPULATION, 76,685. Statistical Divisions.	DEATHS AT ALL AGES.						Population, census of 1885.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Total, including undefined.			Remittent fever, &c.	Typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Camden City	361	167	113	356	202	1,205	52,884	22.79	11	55	......	13	1	8	73	5	187	72	90	82	104	71	37	82	56	16	6	6	69
Centre	7	8	5	11	11	44	1,723	......	1	3	......	......	......	......	......	......	2	3	6	11	2	1	......	4	2	1	......	1	......
Delaware	4	1	1	1	2	9	1,572	......	......	......	......	......	......	......	......	......	3	1	......	......	......	......	......	1	1	......	......	......	2
Gloucester City	22	25	19	43	28	138	5,966	23.13	1	6	......	4	......	......	11	......	12	10	17	6	12	9	2	12	8	1	1	3	10
Gloucester	15	8	5	11	34	75	2,542	......	......	1	......	2	......	1	2	......	8	3	1	2	10	11	1	19	10	1	1	......	......
Haddon	15	3	5	18	22	63	3,270	......	......	1	......	2	......	1	......	......	9	3	7	4	4	4	5	7	5	1	......	......	2
Stockton	38	24	8	39	16	127	4,450	......	1	4	......	2	......	3	6	......	22	3	10	10	7	10	3	7	5	2	......	3	12
Waterford	6	5	6	8	7	32	2,098	......	......	3	......	......	......	......	3	......	4	4	1	3	4	1	......	......	1	......	1	......	3
Winslow	7	3	6	9	8	34	2,180	......	......	1	......	2	......	......	5	......	4	2	2	1	2	6	1	......	2	2	......	......	......
Totals	475	244	168	495	330	1,727	76,685	22.52	14	74	......	25	1	13	100	5	251	101	134	119	145	113	49	132	90	24	9	13	98

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1888.

CAPE MAY COUNTY. POPULATION, 10,744. Statistical Divisions.	DEATHS AT ALL AGES.						Population, census of 1885.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Total, including undefined.			Remittent fever, &c.	Typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhoeal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Cape May City	6	3	1	10	12	32	1,610	....	2	4	......	1	2	......	......	......	1	......	3	2	4	4	......	5	......	......	......	......	2
Dennis	4	......	2	11	10	27	2,328	....	......	2	......	1	1	......	......	......	2	......	2	2	......	2	......	7	2	3	......	......	......
Lower	5	4	3	7	12	31	2,026	....	......	1	......	1	......	......	3	......	......	......	2	2	4	......	1	5	4	1	......	......	1
Middle	2	8	2	13	18	43	2,605	....	1	1	......	......	......	......	6	......	......	5	2	3	2	1	1	9	4	1	......	......	......
Upper	......	......	1	5	6	13	2,175	....	......	......	......	......	......	......	......	......	......	......	2	1	......	1	......	3	3	1	......	......	1
Totals	17	15	9	46	58	146	10,744	13.59	3	8	......	3	3	......	9	......	3	5	11	10	10	8	2	29	13	6	......	......	4

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1888.

CUMBERLAND COUNTY. POPULATION, 41,982. Statistical Divisions.	DEATHS AT ALL AGES.						Population, census of 1885.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Total, including undefined.			Remittent fever, &c.	Typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Bridgeton	39	23	18	47	45	178	10,065	17.69	1	5	......	1	2	......	10	......	26	9	15	23	13	13	5	15	9	7	......	......	8
Commercial	6	2	1	3	6	18	2,544	......	......	1	......	......	......	......	......	......	3	......	1	1	......	......	1	1	1	1	1	1	......
Deerfield	7	1	......	7	5	20	1,632	......	......	......	......	......	......	......	......	......	2	1	2	2	2	1	......	2	3	......	1	......	1
Downe	1	......	1	2	4	8	1,860	......	......	1	......	......	......	......	......	......	......	......	1	1	1	1	......	1	......	......	......	......	1
Fairfield	6	2	1	7	7	23	1,612	......	......	1	......	......	......	......	......	......	3	1	1	1	2	1	1	2	1	3	......	......	2
Greenwich	5	3	......	3	3	14	1,267	......	1	......	......	......	......	......	......	......	1	......	1	3	1	......	3	......	1	......	......	......	......
Hopewell	6	4	2	6	18	37	1,794	......	1	......	......	......	2	......	1	......	3	9	3	2	1	2	1	5	......	......	......	......	......
Landis	16	14	10	36	43	120	7,021	......	......	2	......	2	......	1	8	1	6	18	8	11	8	3	4	9	11	10	1	3	1
Lawrence	4	2	2	10	14	32	1,728	......	......	......	......	......	......	......	......	......	4	1	6	1	4	2	1	5	4	1	......	......	1
Maurice River	11	2	......	5	19	37	2,562	......	1	......	......	......	......	......	1	......	1	1	......	9	1	4	1	5	1	......	......	......	1
Millville	50	44	30	33	34	191	8,824	21.65	......	4	......	......	......	......	53	1	30	7	11	16	3	11	6	10	13	3	1	1	1
Stoe Creek	2	......	......	4	2	8	1,073	......	......	......	......	......	......	......	......	......	......	......	2	......	......	......	1	1	......	......	......	2	......
Totals	153	97	65	163	200	686	41,982	16.34	4	14	......	3	4	1	73	2	79	47	51	70	36	38	24	56	44	25	4	7	16

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1888.

ESSEX COUNTY. POPULATION, 213,764. Statistical Divisions.	DEATHS AT ALL AGES.						Population, census of 1885.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Total, including undefined.			Remittent fever, &c.	Typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Belleville	16	9	3	22	13	63	3,286	....	1	......	......	......	1	3	2	1	7	7	4	6	4	7	2	7	2	......	1	......	3
Bloomfield	28	15	8	25	33	109	6,502	....	1	2	......	2	......	......	6	......	18	5	6	14	8	6	4	14	4	5	......	1	7
Caldwell	7	6	1	15	21	50	3,336	....	......	1	......	......	......	......	2	2	3	......	7	9	1	5	......	9	3	1	......	......	2
Clinton	7	7	2	8	11	35	2,830	....	......	......	......	......	......	......	6	1	5	3	2	4	1	4	1	3	......	1	......	1	......
East Orange	35	24	12	35	36	144	10,328	....	......	3	......	6	......	......	5	1	20	3	8	16	9	8	12	14	5	6	1	2	6
Franklin	6	5	6	14	5	37	1,602	....	......	......	......	......	......	......	4	......	5	5	5	......	5	3	1	3	3	......	......	......	2
Livingston	3	2	1	......	2	8	1,275	....	......	......	......	......	......	......	2	......	2	......	......	......	1	......	......	1	1	......	......	......	......
Millburn	1	6	4	15	8	34	2,023	....	4	2	......	......	......	......	2	......	2	1	2	6	2	......	4	3	3	1	......	......	2
Montclair	19	19	7	38	31	114	6,327	....	1	1	......	1	......	1	9	......	11	5	10	8	11	11	11	11	8	1	1	......	3
Newark	1107	703	372	1286	655	4,133	152,988	27.02	41	76	......	34	10	19	397	20	576	327	230	483	398	218	163	261	180	94	16	32	163
Orange	88	57	26	145	55	373	15,231	24.49	5	4	......	1	1	2	17	1	61	32	17	48	21	20	24	31	28	8	2	4	19
South Orange	10	8	3	18	18	57	4,225	....	......	1	......	......	......	......	3	......	4	6	5	5	7	6	5	5	2	1	......	......	4
West Orange	19	10	4	26	14	70	8,812	....	2	2	......	......	......	......	1	......	11	2	4	5	8	6	2	5	10	......	......	1	4
Totals	1343	871	449	1647	902	5,227	213,764	24.45	55	92	......	44	12	25	456	26	725	396	300	604	476	294	229	367	249	118	21	41	215

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1888.

GLOUCESTER COUNTY. POPULATION, 27,603. Statistical Divisions.	DEATHS AT ALL AGES.						Population, census of 1885.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Total, including undefined.			Remittent fever, &c.	Typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Clayton	13	6	9	11	9	48	2,899	......	......	......	......	......	......	......	3	......	14	4	4	4	2	5	......	1	1	......	......	2	1
Deptford	8	1	2	7	6	24	1,744	......	1	......	......	2	......	1	1	......	3	2	3	1	1	2	1	1	1	1	......	......	1
East Greenwich	5	3	1	3	13	25	1,233	......	......	......	......	......	1	......	2	......	3	1	......	4	......	1	2	3	6	......	......	......	1
Franklin	4	4	2	12	13	35	2,362	......	......	1	......	......	......	......	2	......	1	......	8	5	1	4	1	3	6	......	......	......	......
Glassboro	13	9	9	11	5	47	2,377	......	......	1	......	1	......	......	5	......	4	3	3	3	8	2	1	3	3	......	......	......	4
Greenwich	10	2	1	7	11	31	1,729	......	......	......	......	......	......	......	1	......	7	1	......	2	1	5	......	1	3	2	......	......	4
Harrison	1	1	3	6	14	25	1,637	......	......	......	......	......	......	......	1	......	1	2	......	3	1	......	1	5	5	4	......	......	1
Logan	2	2	2	7	6	19	1,653	......	......	1	......	1	......	1	......	......	......	1	1	4	......	3	2	1	......	......	1	......	1
Mantua	7	2	2	3	12	26	1,624	......	1	......	......	1	......	......	1	1	4	2	......	2	1	3	......	2	1	1	......	......	1
Monroe	15	8	11	16	7	57	1,960	......	......	2	......	13	......	......	2	......	6	1	2	3	2	7	1	3	2	1	......	3	1
South Harrison	3	1	......	4	4	12	1,091	......	......	......	......	......	......	......	......	......	4	1	2	......	......	2	1	1	......	......	......	......	1
Washington	3	......	1	2	8	14	1,265	......	......	......	......	1	......	......	......	1	......	......	......	......	2	2	......	3	1	......	......	......	......
West Deptford	6	3	3	4	4	20	1,305	......	......	1	......	......	......	......	2	......	2	......	1	......	2	2	......	3	2	......	1	......	1
Woodbury	19	13	12	19	23	86	3,278	......	......	1	......	3	......	1	13	1	7	9	4	8	7	4	......	10	4	2	......	2	1
Woolwich	8	9	1	8	2	28	2,046	......	......	2	......	2	......	......	5	......	2	1	4	3	......	2	......	1	......	......	......	......	1
Totals	117	64	59	120	137	497	27,603	18.01	2	9	......	24	1	3	38	3	58	28	32	42	28	44	10	41	35	11	2	7	19

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1888.

HUDSON COUNTY. POPULATION, 240,342. Statistical Divisions.	DEATHS AT ALL AGES.						Population, census of 1885.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Total, including undefined.			Remittent fever, &c.	Typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhoeal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Bayonne	128	65	34	89	28	345	13,080	26.38	11	6	......	1	6	4	28	2	52	7	14	54	37	14	11	9	9	2	3	6	23
Guttenberg	12	8	5	11	7	43	1,615	....	.....	......	......	......	......	3	4	......	5	3	3	7	7	......	1	......	3	1	1	......	1
Harrison	51	30	21	59	33	194	6,806	28.50	6	9	......	1	3	......	14	1	28	12	7	24	25	4	5	11	9	4	......	4	10
Hoboken	294	176	95	397	99	1,061	37,721	28.13	4	15	......	13	8	......	76	4	181	88	46	128	95	68	39	51	42	20	4	6	59
Jersey City	1049	661	377	1363	525	3,980	153,513	26.93	43	114	......	119	10	25	285	15	513	247	226	549	338	206	134	231	178	69	19	39	204
Kearny	22	10	2	32	7	74	3,338	....	3	1	......	......	......	......	......	......	10	2	4	11	11	2	......	3	4	......	......	......	14
North Bergen	32	18	19	90	60	229	5,459	....	3	1	......	1	1	......	15	3	18	32	17	20	9	15	9	26	10	4	2	......	12
Town of Union	59	37	19	66	27	208	8,398	24.77	2	6	......	4	1	1	20	1	40	17	10	27	13	11	4	6	12	8	....	2	8
Union	18	9	3	13	12	55	1,781	....	......	......	......	......	......	1	4	......	10	1	......	14	4	3	3	2	3	1	......	......	3
Weehawken	9	5	1	26	7	48	1,469	....	......	1	......	......	......	......	1	......	6	5	5	2	3	1	2	3	4	1	......	1	8
West Hoboken	61	41	32	48	35	218	7,162	....	2	6	......	1	3	......	26	......	39	9	12	24	26	21	5	13	9	5	......	......	9
Totals	1635	1060	608	2194	840	6,446	240,342	26.82	74	159	......	140	32	34	473	26	902	423	344	860	568	345	218	355	283	115	29	58	351

***Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th,* 1888.**

HUNTERDON COUNTY. POPULATION, 37,429. Statistical Divisions.	DEATHS AT ALL AGES.						Population, census of 1885.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Total, including undefined.			Remittent fever, &c.	Typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Alexandria	2	1	......	3	8	14	1,235	....	1	......	......	......	......	......	1	......	1	......	1	1	......	5	......	1	2	......	......	......	......
Bethlehem	6	7	4	15	11	43	2,780	....	......	......	......	......	......	......	7	......	4	1	3	9	1	3	......	4	1	2	......	1	4
Clinton	5	3	2	8	15	34	2,900	....	......	......	......	......	......	......	2	......	2	1	7	2	1	4	2	7	2	......	1	......	1
Delaware	6	1	2	8	23	41	3,092	....	1	......	......	2	......	......	......	1	1	2	3	3	2	7	2	6	......	1	......	1	1
East Amwell	2	4	2	9	15	32	1,549	....	......	......	......	......	......	1	1	......	2	4	2	4	......	1	3	9	2	......	......	......	1
Franklin	1	......	1	5	10	17	1,387	....	......	......	......	......	......	......	......	......	......	1	1	1	......	3	2	2	5	1	......	......	......
Frenchtown	1	1	......	1	7	10	1,066	....	......	......	......	......	......	......	......	......	......	......	1	3	......	1	......	3	1	......	......	......	......
High Bridge	2	4	......	9	8	23	2,024	....	1	......	......	......	......	......	1	......	......	2	3	3	......	1	3	5	1	1	......	......	1
Holland	4	1	3	9	14	31	1,867	....	......	1	......	......	......	......	2	......	1	1	2	......	2	4	1	6	3	3	......	......	2
Kingwood	3	......	2	2	11	18	1,482	....	......	......	......	......	......	......	......	......	1	......	......	3	2	4	......	2	2	1	......	......	1
Lambertville	9	4	2	18	24	57	4,067	....	1	......	......	......	......	1	3	......	2	3	6	10	2	5	......	9	4	2	......	1	......
Lebanon	5	1	......	7	12	25	2,816	....	......	2	......	......	......	......	......	......	......	1	3	1	4	4	......	3	2	1	......	......	......
Raritan	15	3	4	16	32	71	3,978	....	1	2	......	......	......	......	......	1	6	6	5	2	3	6	4	11	3	6	1	......	2
Readington	8	4	6	10	14	42	2,940	....	......	3	......	......	......	......	3	......	5	2	4	4	4	2	2	8	2	......	......	......	1
Tewksbury	6	3	1	2	8	20	2,081	....	......	2	......	......	......	......	3	......	......	......	......	1	......	1	......	3	1	......	1	1	1
Union	1	2	2	2	4	11	1,195	....	......	......	......	......	......	1	1	......	......	......	......	3	......	1	......	......	......	1	......	......	3
West Amwell	1	......	......	1	3	5	960	....	......	......	......	......	......	......	......	......	1	1	......	1	......	......	......	1	......	......	......	......	......
Totals	77	39	31	125	219	494	37,420	13 20	5	10	......	2	......	3	24	2	26	25	41	51	21	52	19	80	31	19	3	4	18

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1888.

MERCER COUNTY. POPULATION, 66,785. Statistical Divisions.	DEATHS AT ALL AGES.								PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Total, including undefined.	Population, census of 1885.	Death-rate per 1,000.	Remittent fever, &c.	Typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhoeal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Chambersburg	68	24	13	48	15	169	8,542	19.78	......	1	......	......	2	5	15	......	38	15	5	16	14	7	4	9	4	5	......	3	5
East Windsor	11	2	1	18	15	49	2,568	....	......	......	......	......	......	......	1	......	8	5	6	7	......	2	4	4	3	1	......	2	2
Ewing	6	2	6	49	32	97	2,489	....	1	1	......	......	......	1	3	1	......	5	11	3	1	3	3	36	12	......	......	1	4
Hamilton	13	3	4	36	24	82	3,420	....	......	2	......	......	......	......	5	......	8	11	6	5	2	8	3	5	6	1	......	1	7
Hopewell	9	2	3	21	26	61	4,367	....	......	1	......	......	......	1	1	1	5	6	6	4	4	4	4	10	1	1	......	1	2
Lawrence	1	2	1	7	7	18	1,589	....	......	1	......	......	......	......	......	......	1	......	5	1	2	1	......	1	3	1	......	......	1
Millham	22	13	6	19	5	65	2,338	....	......	......	......	......	1	1	14	......	9	2	......	4	4	......	3	1	4	2	1	1	10
Princeton	9	10	4	18	23	65	4,577	....	2	2	......	......	......	......	......	......	4	8	2	5	7	8	4	7	4	2	......	......	3
Trenton	185	93	68	179	140	671	34,386	19.51	5	11	......	4	1	15	67	6	89	47	41	74	33	32	27	48	36	7	5	7	31
Washington	1	1	2	3	2	9	1,196	....	......	......	......	......	......	......	1	......	1	2	1	3	......	......	......	1	......	......	......	......	......
West Windsor	3	4	3	10	9	29	1,313	....	1	1	......	......	......	......	7	......	2	1	3	3	......	1	1	4	......	......	1	......	3
Totals	328	156	111	408	298	1,315	66,785	19.69	9	20	......	4	4	23	114	8	165	102	86	125	67	66	53	126	73	20	7	16	68

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1888.

MIDDLESEX COUNTY. POPULATION, 56,180. Statistical Divisions.	DEATHS AT ALL AGES.						Population, census of 1885.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Total, including undefined.			Remittent fever, &c.	Typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Cranbury	6	1	3	5	11	27	1,569	......	......	1	......	1	......	......	1	......	1	1	2	4	2	1	......	6	1	1	......	......	1
East Brunswick	6	9	5	17	20	57	3,697	......	......	5	......	1	......	......	3	......	6	3	7	5	4	6	3	5	3	1	......	1	4
Madison	2	3	3	9	4	21	1,519	......	1	1	......	1	......	......	......	......	2	1	2	1	2	1	......	2	2	......	......	......	3
Monroe	9	7	3	14	12	45	3,199	......	......	......	......	......	......	......	6	1	9	3	5	5	2	3	1	3	......	......	......	1	1
New Brunswick	59	54	46	99	87	352	18,258	19.28	3	14	......	......	......	1	50	1	40	19	16	26	17	24	18	23	27	13	......	4	22
North Brunswick	8	......	......	8	8	24	1,272	......	1	1	......	......	......	......	......	......	4	1	1	6	......	2	1	3	......	1	......	......	1
Perth Amboy	49	40	22	43	18	173	6,311	27.41	3	3	......	1	......	1	31	1	27	7	7	20	12	7	4	6	4	4	2	1	10
Piscataway	14	1	4	14	18	61	3,155	......	......	3	......	......	......	......	......	......	9	3	3	6	......	5	4	2	2	3	......	......	4
Raritan	7	3	6	11	20	53	3,656	......	1	......	......	......	......	......	1	......	3	......	4	3	4	5	2	3	3	2	......	1	12
Sayreville	7	3	......	5	1	16	2,519	......	......	......	......	......	......	......	......	......	3	......	3	2	1	......	......	......	......	......	......	1	2
South Amboy	12	14	10	24	16	76	4,054	......	3	......	......	2	......	1	3	......	7	6	5	17	4	5	1	4	4	2	1	2	6
South Brunswick	5	5	4	15	15	46	2,714	......	1	2	......	3	......	1	1	1	2	4	3	6	1	3	3	2	2	3	......	......	4
Woodbridge	11	7	2	15	15	50	4,227	......	......	......	......	1	......	......	5	......	6	6	2	5	3	4	1	2	3	2	2	......	2
Totals	195	147	108	279	245	991	56,180	17.64	13	30	......	10	......	4	101	4	119	54	60	106	52	66	38	61	51	32	5	11	72

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1888.

MONMOUTH COUNTY. POPULATION, 62,334. Statistical Divisions.	DEATHS AT ALL AGES.						Population, census of 1885.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Total, including undefined.			Remittent fever, &c.	Typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Atlantic	1	......	......	2	6	9	1,656	....	......	......	......	......	......	......	......	......	......	......	......	1	......	1	1	3	1	......	......	......	2
Eatontown	9	3	1	10	6	29	2,812	....	......	3	......	......	......	......	......	......	6	......	2	2	......	3	3	......	1	2	......	1	2
Freehold	13	12	8	36	38	110	4,494	....	......	......	......	2	......	......	4	......	10	5	6	16	5	14	6	9	9	4	2	3	7
Holmdel	2	1	2	7	8	20	1,640	....	......	......	......	......	......	......	......	......	3	1	3	1	......	2	2	3	3	......	......	1	......
Howell	3	6	4	14	13	40	3,306	....	......	......	......	......	......	......	1	2	3	3	1	4	1	3	3	4	8	2	......	......	......
Long Branch	24	15	13	32	18	103	5,140	20.04	......	2	......	1	......	1	15	1	12	2	3	6	6	7	4	11	11	2	......	2	3
Manalapan	10	3	5	8	11	38	2,143	....	......	......	......	1	......	2	1	1	9	4	2	......	......	2	2	6	2	......	......	......	1
Marlboro	7	......	3	4	8	24	2,089	....	1	......	......	......	......	......	......	......	4	1	1	1	2	3	......	2	5	2	1	......	......
Matawan	12	13	15	13	14	67	2,756	....	......	3	......	13	1	......	6	1	7	2	2	5	4	4	1	5	4	......	1	2	3
Middletown	27	9	7	27	32	102	5,802	....	3	2	......	......	......	......	4	......	15	3	6	17	4	9	4	8	4	3	......	2	1
Millstone	8	1	6	12	9	38	1,917	....	......	1	......	......	......	......	1	......	2	3	5	6	1	3	3	4	2	......	......	......	......
Neptune	31	24	16	31	25	128	6,421	....	1	2	......	1	......	1	8	......	27	5	8	8	10	10	7	13	10	4	1	......	5
Ocean	14	9	5	9	5	42	2,400	....	......	......	......	......	......	......	7	1	9	1	1	5	3	1	4	2	1	......	......	......	4
Raritan	17	16	25	24	26	110	4,288	....	1	2	......	8	......	......	23	......	11	6	5	11	3	10	5	7	3	1	......	......	4
Shrewsbury	26	21	17	47	36	149	7,558	....	1	5	......	1	......	2	17	1	10	10	13	8	9	17	4	13	8	5	1	3	7
Upper Freehold	7	8	7	9	19	50	3,180	....	1	1	......	......	1	......	4	......	4	3	3	5	3	3	2	8	4	......	......	1	......
Wall	21	5	7	21	25	82	4,820	....	1	......	......	1	1	......	1	......	13	4	5	11	3	6	5	8	3	6	1	1	5
Totals	232	146	141	306	299	1,141	62,334	18.31	9	21	......	28	3	6	92	7	145	53	66	107	54	98	56	106	79	31	7	16	44

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1888.

MORRIS COUNTY. POPULATION, 50,675. Statistical Divisions.	DEATHS AT ALL AGES.						Population, census of 1885.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Total, including undefined.			Remittent fever, &c.	Typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhoeal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Boonton	7	7	14	11	14	53	2,732	......	1	......	......	......	......	2	13	2	3	2	6	2	4	1	1	3	4	1	1	......	3
Chatham	17	6	6	25	33	87	4,291	......	......	......	......	1	......	......	6	......	5	9	3	7	1	7	4	11	8	6	2	1	4
Chester	5	2	1	5	9	22	2,510	......	......	1	......	......	......	1	......	......	4	1	......	2	......	......	......	3	2	1	......	......	2
Hanover	6	......	9	54	45	115	4.459	......	1	......	......	......	......	......	......	......	7	8	5	5	2	9	5	65	1	1	......	......	1
Jefferson	5	1	1	7	5	19	1,559	......	......	......	......	......	......	......	......	1	1	2	1	1	2	1	1	1	1	......	......	1	1
Mendham	4	1	1	8	13	27	1,431	......	......	......	......	......	......	......	......	1	1	1	4	7	......	1	......	4	3	......	......	......	1
Montville	4	2	2	4	7	19	1,225	......	1	1	......	......	......	1	2	......	......	2	2	1	......	1	......	......	1	1	......	......	2
Morristown	32	16	17	41	59	166	8,760	18.97	1	1	1	......	......	......	13	......	29	6	12	9	5	8	13	24	14	6	......	2	6
Mount Olive	5	3	4	8	6	26	2,005	......	......	2	......	......	......	1	7	......	1	1	1	3	1	2	......	3	3	......	......	......	......
Passaic	2	3	6	8	13	32	1,716	......	......	......	......	1	......	......	2	......	5	1	2	4	1	5	1	4	1	2	......	......	3
Pequannock	10	1	3	15	6	35	2,625	......	1	1	......	......	......	......	......	......	5	4	3	3	......	1	1	3	3	2	1	1	3
Randolph	38	32	25	25	28	149	7,045	......	......	2	......	5	......	......	30	......	31	6	6	12	5	10	2	7	9	4	......	1	5
Rockaway	31	28	27	19	25	130	5,573	......	1	4	......	2	......	......	29	1	21	3	1	14	9	7	1	4	7	3	1	......	11
Roxbury	10	3	4	9	9	36	2,184	......	1	......	......	......	......	......	3	2	6	1	3	3	1	5	......	......	2	......	......	......	7
Washington	3	4	2	7	9	25	2,560	......	2	1	......	2	......	......	......	......	1	......	2	3	1	3	1	3	3	......	1	......	......
Totals	179	109	122	246	281	941	50,675	18.57	9	13	1	11	......	5	105	7	120	47	51	76	32	61	30	135	62	27	6	6	49

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1888.

OCEAN COUNTY. POPULATION, 15,586. Statistical Divisions.	DEATHS.								PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Total, including undefined.	Population, census of 1885.	Death-rate per 1,000.	Remittent fever, &c.	Typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhoeal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Berkeley	......	......	3	5	5	13	714	....	......	1	......	......	......	......	......	......	......	2	1	3	......	......	1	......	......	......	......	......	4
Brick	7	2	4	20	15	48	3,974	....	......	2	......	......	......	......	3	......	6	4	9	2	1	2	3	2	6	3	1	1	1
Dover	5	5	1	15	12	38	2,594	....	1	3	......	......	......	......	......	......	5	3	2	2	2	4	2	5	4	......	......	......	2
Eagleswood	1	3	5	4	3	16	681	....	......	1	......	......	......	......	5	......	......	1	1	1	2	2	1	......	1	......	......	......	......
Jackson	3	2	2	2	5	14	1,763	....	......	......	......	......	......	......	......	......	2	......	1	3	......	2	......	2	1	......	......	1	......
Lacey	5	1	1	1	8	16	746	....	......	......	......	......	1	1	1	......	......	......	......	......	1	......	2	2	1	1	......	1	......
Manchester	2	1	2	4	2	11	1,098	....	......	1	......	......	......	......	......	......	1	1	1	1	2	1	......	......	......	......	......	......	2
Ocean	1	1	1	1	2	6	541	....	......	1	......	......	......	......	......	......	1	......	......	......	1	1	......	......	......	2	......	......	......
Plumstead	3	6	3	9	9	30	1,546	....	......	4	......	1	......	......	1	2	5	1	1	1	3	2	1	1	2	1	......	2	......
Stafford	4	......	......	6	3	13	1,026	....	......	......	......	......	......	1	......	......	2	2	1	2	......	3	1	......	......	......	......	......	......
Union	8	2	1	2	7	20	1,063	....	......	......	......	1	......	2	......	......	1	1	......	4	1	......	......	2	1	1	......	......	1
Totals	39	23	23	69	71	226	15,586	14.44	1	13	......	2	1	4	10	2	23	15	17	19	13	17	11	14	16	8	1	5	10

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1888.

PASSAIC COUNTY. POPULATION, 83,374. Statistical Divisions.	DEATHS AT ALL AGES.						Population, census of 1885.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																					
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Total, including undefined.			Remittent fever, &c.	Typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Acquackanonk	9	5	5	10	6	35	2,038	....	......	......	......	2	......	......	3	......	4	3	......	3	2	1	2	1	1	3	......	1	3
Little Falls	10	3	4	8	9	34	1,701	....	......	......	......	1	......	......	......	......	4	4	2	3	2	4	1	1	3	1	......	......	1
Manchester	6	4	6	9	......	26	1,639	....	2	1	......	4	......	......	1	......	2	......	1	2	3	......	1	1	......	......	......	......	5
Passaic	65	38	23	45	32	203	8,326	24.38	3	7	......	2	1	......	15	......	45	10	6	23	19	9	6	13	10	2	3	2	6
Paterson	434	345	169	506	249	1,719	63,273	27.17	13	21	......	172	3	1	97	9	205	112	108	170	154	97	60	79	81	28	5	28	65
Pompton	8	3	1	12	10	34	2,109	....	1	......	......	......	......	......	2	......	1	4	2	8	3	4	......	1	2	......	......	......	2
Wayne	5	1	1	5	11	23	1,866	....	1	1	......	......	......	......	......	......	3	......	1	2	......	5	2	1	3	......	......	1	......
West Milford	5	3	3	5	11	28	2,422	....	......	......	......	......	......	......	......	......	5	1	1	5	2	......	1	4	1	1	......	......	1
Totals	542	402	212	600	328	2,102	83,374	25 34	20	30	......	181	4	1	118	9	269	134	121	216	185	120	73	101	101	35	8	32	83

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1888.

SALEM COUNTY. POPULATION, 25,373. Statistical Divisions.	DEATHS AT ALL AGES.						Population, census of 1885.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Total, including undefined.			Remittent fever, &c.	Typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhoeal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Alloway	1	2	3	3	13	23	1,749	......	1	......	......	1	......	......	3	......	......	1	3	2	1	......	1	2	1	2	......	2	......
Elsinboro	1	......	1	......	1	3	571	......	......	1	......	......	......	......	......	......	......	......	......	1	......	......	......	......	......	......	......	......	......
Lower Alloways Creek	4	1	......	4	5	15	1,365	......	......	......	......	......	......	......	......	......	1	1	......	1	......	2	4	1	......	......	......	1	1
Lower Penns Neck	2	2	2	4	5	15	1,408	......	......	......	......	......	......	......	......	......	2	......	1	1	......	3	......	1	2	......	......	1	3
Mannington	6	6	7	12	27	59	2,161	......	......	1	......	......	......	......	......	3	6	1	5	5	6	2	3	4	4	1	1	2	3
Oldmans	4	4	......	6	4	18	1,463	......	......	......	......	......	......	......	2	......	4	1	2	1	1	1	......	......	1	3	......	1	......
Pilesgrove	11	4	5	17	20	57	3,397	......	......	......	......	......	......	......	......	......	6	3	7	10	4	3	2	8	6	1	......	......	1
Pittsgrove	8	11	9	14	10	53	2,135	......	......	......	......	1	......	......	13	......	4	2	1	4	4	5	2	5	3	2	......	......	......
Quinton	6	1	1	5	3	16	1,460	......	......	......	......	......	......	......	......	......	2	1	2	3	......	......	......	2	1	......	1	......	1
Salem City	25	9	12	23	32	103	5,516	18.85	2	7	......	3	......	1	1	......	12	7	8	8	3	13	4	9	6	......	1	......	1
Upper Penns Neck	6	5	6	5	13	35	2,216	......	......	......	......	1	......	......	8	......	1	......	3	3	2	3	......	4	4	1	......	......	......
Upper Pittsgrove	4	2	3	3	8	20	1,932	......	......	......	......	......	......	1	4	......	4	2	......	1	......	......	......	3	1	......	......	1	......
Totals	78	47	49	96	141	417	25,373	16.43	3	9	......	6	......	2	31	3	42	19	32	40	21	32	16	39	29	10	3	8	10

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1888.

SOMERSET COUNTY. POPULATION, 27,425. Statistical Divisions.	DEATHS AT ALL AGES.						Population, census of 1885.	Death-rate per 1,000.	PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Total, including undefined.			Remittent fever, &c.	Typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Bedminster	7	4	1	7	9	28	1,769	....	......	......	......	......	......	......	2	......	5	2	......	3	......	1	2	5	1	......	......	2	1
Bernards	6	3	2	15	19	45	2,504	....	......	......	......	1	......	......	1	......	4	5	2	3	......	4	5	9	4	......	......	......	1
Branchburg	2	2	......	4	11	19	1,177	....	1	......	......	......	......	......	......	......	......	1	2	1	1	4	2	3	1	......	......	......	1
Bridgewater	30	10	11	29	45	125	8,454	....	1	......	......	6	......	......	4	1	17	5	6	10	5	11	3	15	9	5	......	1	10
Franklin	4	6	2	17	21	50	3,720	....	......	1	......	......	......	1	......	2	4	3	5	6	1	6	4	7	1	5	......	......	1
Hillsboro	7	6	2	12	16	43	3,151	....	......	......	......	1	......	......	......	......	9	3	4	3	3	2	4	4	4	......	......	1	2
Montgomery	2	2	3	10	12	28	1,800	....	......	1	......	......	......	......	......	......	3	2	1	3	1	......	2	4	3	1	1	......	4
North Plainfield	11	10	12	15	18	66	3,728	....	......	......	......	3	......	......	11	1	7	3	7	8	1	6	3	7	2	1	......	......	1
Warren	3	3	2	6	4	18	1,122	....	......	......	......	......	......	......	1	1	4	1	2	2	1	1	2	......	3	......	......	......	......
Totals	72	46	34	115	155	422	27,425	15.39	2	2	......	11	......	1	19	5	53	25	29	39	13	35	27	54	28	12	1	4	21

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1888.

SUSSEX COUNTY. POPULATION, 22,401. Statistical Divisions.	DEATHS AT ALL AGES.								PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Total, including undefined.	Population, census of 1885.	Death-rate per 1,000.	Remittent fever, &c.	Typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhoeal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Andover	1	1	......	5	3	10	1,014	....	......	......	......	......	......	......	1	......	1	3	......	......	......	2	......	1	......	1	......	......	......
Byram	3	3	1	3	5	15	1,242	....	......	......	......	......	......	......	......	......	2	2	......	3	2	......	......	......	2	......	1	......	2
Frankford	2	1	1	4	18	26	1,495	....	......	......	......	......	......	......	......	......	1	3	2	2	......	3	1	4	3	......	......	......	1
Greene	1	1	......	......	2	4	704	....	......	......	......	......	......	......	......	......	1	......	......	......	......	1	......	......	......	......	......	......	1
Hampton	5	1	......	1	2	9	938	....	......	......	......	......	......	......	1	......	1	......	......	1	......	......	......	1	......	......	......	1	......
Hardyston	5	1	1	10	7	24	2,500	....	......	......	......	......	......	......	1	......	1	3	1	2	1	2	4	2	......	1	......	......	2
Lafayette	3	1	......	4	1	9	816	....	......	1	......	......	......	......	......	......	2	......	......	2	......	2	......	......	1	......	......	......	......
Montague	2	1	......	......	4	7	900	....	......	......	......	......	......	1	......	......	1	......	......	2	......	......	......	2	1	......	......	......	......
Newton	1	......	3	11	6	23	2,648	....	......	3	......	......	......	......	......	......	......	3	1	2	......	1	2	3	......	2	......	......	3
Sandyston	1	1	1	7	8	18	1,092	....	......	2	......	......	1	......	......	......	2	......	......	......	......	3	......	1	2	3	......	......	1
Sparta	6	2	......	9	15	32	1,901	....	......	......	......	2	......	......	......	......	3	3	2	2	1	3	2	5	2	2	1	......	1
Stillwater	1	......	1	5	8	15	1,366	....	......	......	......	......	......	......	......	......	1	1	1	2	......	3	......	4	1	1	......	......	1
Vernon	3	......	2	3	9	17	1,855	....	......	2	......	......	......	......	......	......	1	2	2	1	......	1	......	4	2	......	......	......	1
Walpack	1	......	1	1	......	3	553	....	......	1	......	......	......	......	......	......	1	......	......	......	......	......	1	......	......	......	......	......	......
Wantage	4	6	6	10	23	49	3,377	....	......	......	......	......	2	1	1	......	3	2	5	6	5	7	1	8	3	......	......	......	1
Totals	39	19	17	73	111	261	22,401	11.65	......	9	......	2	3	2	4	......	21	22	14	25	9	28	11	35	17	10	2	1	14

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1888.

UNION COUNTY. POPULATION, 61,839. Statistical Divisions.	DEATHS AT ALL AGES.								PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Total, including undefined.	Population, census of 1885.	Death-rate per 1,000.	Remittent fever, &c.	Typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Clark	......	......	1	1	4	6	363	......	1	1	......	......	......	......	......	......	......	1	......	1	......	......	......	1	......	......	......	......	1
Cranford	......	1	1	2	3	7	1,251	......	......	1	......	......	......	......	......	......	......	......	1	2	......	......	......	1	......	1	......	......	1
Elizabeth	200	116	79	235	127	758	32,119	23.28	14	12	3	2	1	14	77	4	103	37	40	81	51	44	27	52	39	13	3	5	47
Fanwood	3	......	1	2	6	12	1,210	......	......	......	......	......	......	......	......	1	3	......	1	1	......	......	1	2	2	......	1	......	......
Linden	12	......	7	17	12	48	1,971	......	......	......	......	......	......	1	4	......	4	1	3	6	2	3	3	8	1	3	......	......	4
New Providence	3	1	1	3	11	19	824	......	......	1	......	......	......	......	1	......	1	3	1	......	1	......	......	3	2	2	1	......	......
Plainfield	53	31	13	54	48	199	8,913	22.31	...	3	......	1	......	2	16	......	36	13	9	22	11	11	12	18	7	12	1	......	8
Rahway	29	13	10	43	45	140	6,861	20.41	1	5	......	3	......	2	3	......	11	5	12	17	13	10	3	17	9	3	1	......	10
Springfield	3	......	1	3	8	15	847	......	2	......	......	......	......	......	......	......	1	1	......	3	2	1	1	1	2	......	......	......	......
Summit	11	8	5	12	12	49	2,539	......	......	......	......	......	......	......	1	......	9	3	3	4	4	6	2	2	3	......	1	......	4
Union	9	5	7	9	11	41	2,589	......	1	2	......	......	1	......	6	......	2	1	1	9	2	2	......	2	4	1	......	......	......
Westfield	11	5	5	9	17	48	2,352	......	1	3	......	2	......	......	......	......	3	3	4	11	......	1	2	1	4	1	2	......	1
Totals	334	180	131	390	304	1,342	61,839	21.86	20	28	3	8	2	19	108	5	173	68	75	157	86	78	51	108	73	36	10	5	76

Return of Deaths from all Causes and Certain Specified Diseases, in the Statistical Divisions of the State of New Jersey, for the Year ending June 30th, 1888.

WARREN COUNTY. POPULATION, 37,737. Statistical Divisions.	DEATHS AT ALL AGES.								PRINCIPAL CAUSES OF DEATH.																				
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Total, including undefined.	Population, census of 1885.	Death-rate per 1,000.	Remittent fever, &c.	Typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhœal diseases.	Consumption—male.	Consumption—female.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.	Accident.
Allamuchy	3	......	2	4	1	11	787	......	......	1	......	1	......	......	......	......	1	......	2	2	......	......	......	......	2	......	......	1	......
Belvidere	6	5	6	8	18	38	1,814	......	......	......	......	......	......	......	7	......	3	5	4	1	4	3	......	3	1	......	......	......	1
Blairstown	1	3	1	5	7	17	1,590	......	......	......	......	1	......	......	1	......	2	1	1	1	......	1	2	1	1	1	1	1	1
Franklin	8	2	3	5	6	24	1,382	......	......	......	......	4	......	1	......	......	3	2	1	2	1	3	1	2	......	......	......	......	......
Frelinghuysen	1	......	......	1	12	14	964	......	1	1	......	......	......	......	......	......	......	1	1	1	......	3	1	......	......	......	1	1	......
Greenwich	2	2	1	7	10	22	920	......	1	......	......	......	......	......	1	......	......	2	1	2	......	1	1	3	......	2	......	......	4
Hackettstown	8	1	3	15	9	36	2,645	......	......	1	......	......	......	......	1	......	4	3	3	3	1	4	1	5	2	1	1	......	5
Hardwick	2	......	......	4	3	9	520	......	......	1	......	......	......	......	......	......	1	......	1	......	1	......	......	1	1	......	......	2	1
Harmony	1	......	1	4	12	18	1,256	......	......	......	......	1	......	......	......	......	......	2	1	2	......	2	2	......	5	......	......	......	1
Hope	5	2	3	9	8	22	1,548	......	......	1	......	......	......	......	......	......	3	2	1	3	1	1	1	......	5	......	1	......	1
Independence	3	......	......	2	7	12	1,184	......	......	1	......	......	......	......	......	......	2	......	......	1	1	2	......	1	1	1	......	......	1
Knowlton	2	1	1	8	15	27	1,456	......	......	......	......	......	......	......	......	......	3	3	......	2	......	2	2	2	3	4	2	3	......
Lopatcong	3	6	3	5	8	25	1,726	......	......	1	......	......	......	......	3	......	1	......	3	4	1	3	2	1	3	1	......	......	......
Mansfield	4	1	2	4	12	24	1,600	......	......	......	......	......	......	......	1	......	1	2	2	5	1	3	1	5	......	......	......	......	1
Oxford	15	28	13	23	15	94	4,383	......	3	1	......	13	......	......	10	......	9	5	5	12	2	1	4	3	1	2	......	......	9
Pahaquarry	......	......	......	1	2	3	351	......	......	......	......	......	......	......	......	......	......	......	......	......	......	1	......	......	1	1	......	......	......
Phillipsburg	27	12	12	29	27	107	8,058	13.28	2	1	......	2	......	1	7	......	17	3	9	5	6	6	5	15	9	3	......	......	7
Pohatcong	2	2	4	3	6	17	1,567	......	......	......	......	1	......	......	5	......	1	......	1	1	1	2	2	2	......	......	1	......	......
Washington	16	7	6	14	19	62	4,038	......	......	2	......	5	......	......	......	......	11	2	4	5	1	6	3	5	3	2	......	1	2
Totals	109	72	61	151	187	582	37,737	15.42	7	11	......	28	......	2	36	......	62	33	40	53	21	44	28	49	38	18	7	9	34

COMPARISON OF DEATH-RATES.

I. MORTALITY IN VARIOUS CITIES FOR COMPARISON WITH STATE TABLES—DEATH-RATES PER 1,000 POPULATION IN THIRTY LOCALITIES, VIZ., NINE IN THE UNITED STATES AND TWENTY-ONE IN FOREIGN COUNTRIES

Nine United States Localities.	Five Years. 1880–4.
New Orleans	29.11
New York	27.76
Baltimore	25.03
Brooklyn	23.39
Boston	22.67
Cincinnati	22.52
Chicago	21.83
*St. Louis	20.56
Massachusetts	20.54
Twenty-one Foreign Localities.	
St. Petersburg	*41.40
Budapesth	32.24
Munich	31.67
Naples	32.84
Breslau	31.86
Marseilles	31.05
Berlin	27.75
Vienna	28.26
Thirteen Italian cities	29.16
Rome	29.02
Brussels	25.22
Stockholm	24.89
Hamburg	24.79
One hundred and seventy-three German cities	26.47
Turin	27.99
Dresden	25.35
Leipsic	25.21
Paris	23.49
London	21.20
Frankfort am Main	20.04
England	19.60

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* Four years.

II. MORTALITY IN VARIOUS CITIES OF THE UNITED KINGDOM OF GREAT BRITAIN OF OVER 100,000 INHABITANTS.

Towns.	Annual Rate to 1,000 of Population, of Deaths in 52 Weeks, Ending Dec. 31st, 1887.	Population on Acre.
London	19.5	*56.0
Brighton	16.8	47.0
Portsmouth	19.4	31.9
Bristol	20.3	48.3
Birmingham	19.6	52.5
Leicester	19.4	44.7
Nottingham	18.6	22.5
Bolton	21.2	46.7
Manchester	28.6	87.9
Salford	22.1	42.3
Oldham	23.7	28.4
Blackburn	25.4	16.8
Preston	27.8	27.5
Bradford	19.8	20.8
Leeds	21.0	16.0
Sheffield	21.5	16.1
Hull	19.1	24.9
Sunderland	19.6	42.8
Newcastle-on-Tyne	25.2	29.2
Cardiff	21.8	14.2
Edinburgh	19.7	43.8
Glasgow	23.1	85.8
Dublin	30.5	14.3
Liverpool	23.6	113.8

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* London has less population to the house than any of the larger European cities.

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DECENNIAL TABLES.

The following are the tables of ten previous years, so combined as to give the means and other averages for the various years and then the totals. In some cases the data were not complete for all the years, but only for five years, and so those have been given.

Statement of Marriages, including all Supplements, for the Ten Years ending June 30th, 1888.

	1878–79.	1879–80.	1880–81.	1881–82.	1882–83.	1883–84.	1884–85.	1885–86.	1886–87.	1887–88.	Supplements.	Totals.
Atlantic County.....	92	82	88	89	91	119	108	108	120	93	21	1,011
Atlantic City......	19	33	31	45	67	74	95	99	165	152	10	790
Bergen County......	198	198	187	223	178	200	217	288	224	236	24	2,108
Burlington County.	261	274	262	268	274	280	286	258	220	258	87	2,623
Bordentown	47	47	39	47	58	40	52	29	55	38	2	454
Burlington City...	65	57	47	59	54	53	70	83	98	101	11	693
Camden County.....	76	118	90	61	77	81	72	98	126	116	8	913
Camden City.......	341	424	399	443	451	498	582	2,668	4,780	4,986	59	15,476
Gloucester City...	28	41	32	39	44	39	30	43	56	88	2	442
Cape May County..	95	78	65	65	58	78	72	82	81	75	26	765
Cumberland Co......	188	140	140	167	152	161	174	180	156	180	19	1,607
Bridgeton...........	82	129	96	118	90	118	111	96	92	105	2	1,039
Millville.............	62	90	82	100	71	100	70	97	97	95	6	870
Essex County.........	211	213	183	225	201	210	205	259	268	307	104	2,386
Newark...............	1,022	1,141	1,286	1,358	1,388	1,257	1,274	1,416	1,468	1,542	482	13,529
Orange................	90	103	92	125	123	99	132	149	149	177	14	1,253
Gloucester County..	175	165	190	169	165	165	186	202	202	186	23	1,828
Hudson County.....	45	42	39	54	106	99	91	91	116	131	145	959
Bayonne	15	32	47	61	61	66	59	81	99	99	77	697
Harrison.............	9	6	9	6	31	20	14	19	27	23	118	282
Hoboken	221	193	214	330	349	365	315	458	418	482	250	3,595
Jersey City..........	576	705	765	826	948	989	877	952	1,212	1,289	1,063	10,202
Town of Union...	34	45	47	65	83	92	101	114	124	161	50	916
Hunterdon County.	285	276	248	242	261	256	284	314	354	389	78	2,982
Mercer County.......	129	126	126	124	108	95	103	139	144	148	18	1,265
Chambersburg....	80	39	38	31	47	42	45	88	100	92	1	553
Trenton..............	264	326	323	344	347	360	380	478	549	580	41	3,987
Middlesex County..	182	168	149	170	215	169	167	180	167	194	41	1,747
New Brunswick..	107	116	142	178	150	149	149	168	145	125	7	1,436
Perth Amboy......	13	22	22	75	55	66	41	45	61	54	....	454
Monmouth County.	325	414	392	398	438	421	488	424	456	436	59	4,196
Long Branch......	49	46	61	47	63	71	67	60	59	51	9	583
Morris County........	221	271	271	279	298	243	221	258	260	244	40	2,601
Morristown..........	41	39	37	29	48	54	59	54	53	51	23	488
Ocean County........	84	103	94	84	107	112	98	126	130	110	36	1,079
Passaic County......	50	86	81	76	70	44	75	69	58	56	18	673
Passaic City.........	48	49	66	71	67	71	50	58	99	87	46	702
Paterson	347	431	522	568	594	469	562	568	708	769	100	5,683
Salem County........	124	123	109	99	108	114	91	112	98	116	20	1,109
Salem City..........	68	33	38	51	50	44	68	55	76	68	8	549
Somerset County....	159	162	181	164	168	163	185	181	187	185	21	1,756
Sussex County.......	169	177	155	179	198	168	159	197	191	164	85	1,792
Union County........	38	54	49	44	63	64	55	74	59	50	29	579
Elizabeth............	168	158	223	269	241	263	259	240	242	281	6	2,350
Plainfield	19	57	49	67	57	81	51	64	38	68	24	575
Rahway..............	58	59	48	51	56	58	46	44	51	68	53	592
Warren County......	230	202	232	195	225	185	193	264	297	334	42	2,399
Phillipsburg........	51	58	78	64	82	58	65	301	492	490	13	1,742
Totals............	7,096	7,936	8,109	8,337	9,166	8,968	8,989	12,351	15,416	16,025	3,306	106,199

Statement of Births, including all Supplements, for the Ten Years ending June 30th, 1888.

	1878–79.	1879–80.	1880–81.	1881–82.	1882–83.	1883–84.	1884–85.	1885–86.	1886–87.	1887–88.	Supplements.	Totals.
Atlantic County.....	290	281	294	272	262	293	843	290	847	848	20	3,085
Atlantic City.......	62	120	120	90	100	156	172	205	231	199	1	1,456
Bergen County.......	628	748	673	666	676	629	729	702	785	692	284	7,112
Burlington County.	877	915	804	749	758	784	781	788	802	722	309	8.229
Bordentown.......	188	124	126	107	186	188	110	100	130	102	20	1,221
Burlington City...	145	185	142	88	182	144	182	140	126	89	98	1,861
Camden County.....	835	848	824	831	828	347	878	871	415	424	44	3,640
Camden City.......	888	716	639	696	762	807	860	875	928	1,111	110	8,892
Gloucester City...	125	140	129	159	184	145	129	68	182	150	72	1,878
Cape May County...	195	282	183	227	215	221	245	197	219	198	49	2,174
Cumberland Co......	890	877	370	428	404	410	421	477	510	449	862	4,598
Bridgeton............	219	205	207	219	255	242	258	271	274	246	2	2,898
Millville..............	218	201	262	266	244	240	255	291	279	803	29	2,588
Essex County.........	740	752	888	836	872	868	798	836	747	887	281	8,455
Newark...............	8,567	8,518	3,787	8,646	8,952	8,889	3,494	4,311	4,540	4,751	1,980	41,885
Orange	485	429	403	417	418	880	449	416	468	467	11	4,293
Gloucester County..	618	638	649	626	610	640	593	643	647	577	49	6,285
Hudson County.....	264	258	267	267	356	889	402	468	510	611	827	4,114
Bayonne......	140	190	185	161	251	229	196	276	298	287	807	2,520
Harrison.............	102	132	120	148	164	198	168	207	249	248	72	1,808
Hoboken	795	784	783	695	788	961	816	989	1,178	1,282	1,019	10,080
Jersey City..........	1,582	1,528	1,487	1,288	1,571	1,841	1,661	2,155	2,566	8,814	2,294	21,182
Town of Union...	140	142	148	150	174	226	216	226	264	251	87	2,026
Hunterdon County.	800	789	755	650	629	684	684	629	604	584	179	6,887
Mercer County.......	408	410	870	856	872	872	846	807	256	822	64	3,678
Chambersburg....	114	98	141	149	168	188	111	121	172	228	25	1,505
Trenton..............	596	568	586	588	633	636	489	488	582	622	77	5,810
Middlesex County..	461	553	518	584	547	529	505	527	545	517	152	5,888
New Brunswick..	428	458	430	405	432	462	480	882	886	881	98	4,282
Perth Amboy......	77	204	145	190	216	228	195	205	176	145	85	1,811
Monmouth County.	958	1,018	1,028	954	970	1,056	973	1,079	982	878	150	10,086
Long Branch	222	156	140	165	204	212	242	101	141	181	8	1,717
Morris County........	816	882	864	855	894	797	749	683	784	674	250	8,248
Morristown.........	127	180	115	104	119	165	145	164	158	178	23	1,423
Ocean County........	818	819	828	821	294	838	810	310	277	255	95	3,160
Passaic County......	141	208	184	164	209	187	174	182	189	192	38	1,808
Passaic City........	204	216	208	214	247	194	265	246	288	278	....	2,360
Paterson	1,218	1,322	1,469	1,517	1,617	1,641	1,605	1,584	1,889	1,838	25	15,620
Salem County........	429	442	889	864	311	867	840	819	312	827	60	3,660
Salem City..........	89	83	97	110	115	126	122	115	104	98	82	1,091
Somerset County....	507	564	513	489	467	446	442	468	446	414	82	4,888
Sussex County........	856	821	295	287	249	234	227	251	288	219	118	2,844
Union County........	218	289	227	203	229	216	216	211	212	179	89	2,239
Elizabeth............	747	679	707	818	831	925	918	882	885	894	18	8,289
Plainfield............	188	166	161	146	191	168	174	122	169	196	14	1,690
Rahway...............	105	182	114	96	117	97	74	108	126	125	102	1,191
Warren County......	549	682	616	664	571	678	561	605	581	488	44	6,084
Phillipsburg........	218	208	249	248	251	265	284	219	210	218	1	2,811
Totals............	23,116	23,680	23,484	23,108	24.480	25,263	24,077	25,497	27,840	28,074	9,481	257,550

Statement of Deaths, including all Supplements, for the Ten Years ending June 30th, 1888.

	1878–79.	1879–80.	1880–81.	1881–82.	1882–83.	1883–84.	1884–85.	1885–86.	1886–87.	1887–88.	Supplements.	Totals.
Atlantic County	238	221	211	234	217	209	248	204	228	259	18	2,287
Atlantic City	64	93	134	174	144	178	187	167	214	233	....	1,588
Bergen County	636	510	553	649	642	535	602	587	668	698	76	6,156
Burlington County	749	596	623	692	606	568	631	578	669	759	129	6,600
Bordentown	86	90	87	90	90	105	93	93	78	97	2	911
Burlington City	154	113	132	166	134	137	188	165	133	165	12	1,499
Camden County	314	297	354	285	340	248	310	296	332	334	64	3,219
Camden City	678	808	954	1,023	834	932	968	1,019	1,079	1,205	18	9,508
Gloucester City	72	84	108	98	117	116	92	99	137	138	2	1,063
Cape May County	120	126	132	134	131	144	161	150	174	146	33	1,451
Cumberland Co	358	282	296	343	275	304	357	276	282	317	32	3,122
Bridgeton	183	155	172	208	185	163	179	120	163	178	2	1,608
Millville	137	174	174	136	140	142	149	139	146	191	14	1,542
Essex County	616	526	521	663	626	548	633	563	549	721	145	6,111
Newark	3,116	2,553	2,334	3,925	3,480	3,872	3,729	3,663	3,784	4,133	68	34,657
Orange	215	216	288	337	233	291	300	304	332	378	3	2,897
Gloucester County	431	375	393	471	407	426	461	461	443	497	19	4,384
Hudson County	374	367	326	598	527	450	505	571	521	658	15	4,912
Bayonne	156	141	154	253	196	208	243	311	303	345	3	2,313
Harrison	104	129	138	172	153	152	159	177	182	194	2	1,562
Hoboken	669	784	785	976	803	706	843	925	916	1,061	18	8,486
Jersey City	2,517	2,533	2,851	3,646	3,108	3,041	3,442	3,380	3,686	3,980	99	32,283
Town of Union	137	121	229	216	209	137	217	185	191	208	3	1,853
Hunterdon County	527	475	529	570	549	429	466	486	481	494	33	5,039
Mercer County	364	321	337	459	447	368	422	380	425	475	62	4,060
Chambersburg	92	109	97	138	119	124	140	171	178	169	10	1,347
Trenton	658	618	565	615	622	632	601	520	612	671	24	6,138
Middlesex County	435	425	448	530	486	431	444	482	389	466	41	4,577
New Brunswick	323	269	323	390	460	397	336	348	350	352	8	3,558
Perth Amboy	77	88	79	135	139	150	166	121	150	173	....	1,278
Monmouth County	756	669	770	1,002	905	766	939	837	958	1,033	61	8,696
Long Branch	170	83	115	147	133	92	126	66	72	103	3	1,110
Morris County	715	557	785	878	779	606	680	617	697	775	107	7,146
Morristown	114	128	109	121	198	142	128	120	119	166	9	1,354
Ocean County	217	162	198	220	208	226	268	220	211	225	30	2,180
Passaic County	169	152	160	190	158	119	175	134	139	180	23	1,599
Passaic City	124	142	129	149	136	154	139	175	190	203	....	1,541
Paterson	994	1,174	1,161	1,512	1,415	1,446	1,284	1,100	1,402	1,719	8	13,215
Salem County	280	286	279	358	299	298	248	266	251	314	32	2,906
Salem City	112	76	74	98	117	78	106	128	89	108	16	992
Somerset County	429	343	405	504	449	348	418	342	436	422	26	4,122
Sussex County	330	284	320	459	315	298	324	278	296	261	59	3,214
Union County	195	186	196	231	210	187	220	170	204	245	34	2,078
Elizabeth	472	440	564	612	686	591	697	607	717	758	4	6,148
Plainfield	130	98	130	151	161	132	141	153	153	199	1	1,449
Rahway	169	116	104	133	131	111	107	100	116	140	9	1,236
Warren County	420	406	417	649	444	359	392	374	391	475	38	4,365
Phillipsburg	102	126	114	169	147	130	148	116	155	107	....	1,314
Totals	20,440	18,967	20,312	25,959	23,310	21,716	23,307	22,734	24,331	27,173	1,460	230,709

Summary of Vital Facts from New Jersey Death Record, by Counties, for Ten Years ending June 30th, 1888.

COUNTIES.	DEATHS AT ALL AGES.								PRINCIPAL CAUSES OF DEATH.																		
Statistical Divisions.	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Total, including undefined.	Population, census of 1885.	Death-rate per 1,000.	Remittent fever, &c.	Typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhoeal diseases.	Consumption.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.
Atlantic	1,009	521	311	1,047	1,009	....	....	....	11	85	12	50	16	44	163	24	563	534	288	268	235	156	312	234	88	10	45
Bergen	1,265	764	574	1,803	1,621	....	....	....	153	133	6	156	23	47	227	29	602	783	702	432	452	241	484	332	127	24	69
Burlington	1,803	1,066	783	2,479	2,731	....	....	....	82	293	19	143	26	87	405	47	913	1,265	785	513	623	314	736	568	228	37	101
Camden	3,588	1,954	1,398	4,080	2,535	....	....	....	137	550	161	324	31	113	676	30	1,791	1,971	1,188	1,050	737	165	984	575	239	30	143
Cape May	313	142	109	343	487	....	....	....	15	51	......	35	7	20	42	5	146	159	129	86	75	31	193	101	57	3	10
Cumberland	1,394	845	573	1,661	1,682	....	....	....	27	210	1	126	28	38	353	32	683	1,011	585	433	392	200	478	330	140	20	57
Essex	10,368	7,066	4,110	14,066	7,656	....	....	....	529	1071	29	1237	304	347	3 093	194	4,683	6,477	5,039	3,792	2,446	1697	2,917	1,836	964	102	454
Gloucester	960	539	396	1,177	1,235	....	....	....	45	121	9	94	10	41	170	20	501	644	405	294	263	109	367	277	98	19	37
Hudson	13,332	9,568	5,045	16,770	6,264	....	....	....	684	1285	356	1642	412	384	3,463	188	6,444	6,440	6,017	4,383	2,344	1538	2,442	2,027	833	144	524
Hunterdon	789	451	417	1,330	1,965	....	....	....	61	114	2	102	19	28	215	32	332	694	458	222	447	187	606	287	156	18	65
Mercer	2,453	1,390	1,043	3,581	2,696	....	....	....	96	255	23	269	83	102	482	71	1,162	1,781	1,033	651	627	366	1,155	574	274	49	123
Middlesex	2,097	1,268	997	2,726	2,143	....	....	....	125	228	12	222	43	101	572	33	1,155	1,300	879	585	506	381	619	474	232	38	92
Monmouth	2,214	1,158	906	2,595	2,634	....	....	....	107	183	7	146	45	102	443	32	1,183	1,309	943	549	715	394	815	592	213	40	99
Morris	1,540	1,017	807	2,543	2,383	....	....	....	161	160	1	257	40	67	386	46	697	1,066	959	492	533	290	1,101	444	188	50	110
Ocean	405	234	184	672	624	....	....	....	12	86	1	22	17	21	85	12	195	382	191	132	116	65	186	149	48	9	33
Passaic	4,171	2,691	1,544	4,871	2,790	....	....	....	216	344	42	606	129	114	571	67	2,174	2,311	1,775	1,417	850	564	365	716	298	45	190
Salem	856	472	396	938	1,165	....	....	....	43	136	8	44	10	34	191	28	413	589	372	188	198	116	347	212	96	18	38
Somerset	722	391	402	1,155	1,394	....	....	....	70	61	3	83	22	30	201	25	353	534	415	189	302	180	455	259	122	23	48
Sussex	476	306	303	934	1,082	....	....	....	56	91	......	86	7	20	112	18	210	461	389	159	256	106	315	166	88	12	44
Union	2,586	2,594	1,081	3,165	2,431	....	....	....	197	206	9	271	58	104	689	46	1,219	1,425	1,203	900	672	346	789	480	232	35	102
Warren	1,153	749	595	1,549	1,535	....	....	....	57	135	11	213	25	28	269	33	502	690	613	394	343	193	493	312	113	32	71
Totals	53,494	35,136	21,974	69,485	48,062	....	....	....	2894	5797	712	6108	1355	1872	12,808	1012	25,921	31,826	24,383	17,629	13,131	7539	14,059	10,935	4829	758	2455

Total deaths in the State, for ten years (including supplements), was 230,709, and the average death-rate 19.15.

Rates for short periods, or which deal with small numbers, are only approximate and sometimes misleading, since temporary causes may have been in operation, and small numbers do not eliminate or balance errors which practically disappear in large aggregates. So, five or ten years' analyses are much more important than any single year. The number of deaths before twenty, in proportion to the rest, is much more informatory as to local causes affecting health, than the total deaths. See, also, the number dying from zymotic diseases, and especially from fevers, croup, diphtheria, diarrhoeal diseases, consumption, and brain and nervous diseases of children.

Summary of Vital Facts from New Jersey Death Record, in Cities of over 5,000 Population, for Ten Years ending June 30th, 1888.

CITIES HAVING OVER 5,000 POPULATION. Statistical Divisions.	DEATHS AT ALL AGES.								PRINCIPAL CAUSES OF DEATH.																		
	Under one year.	One to five.	Five to twenty.	Twenty to sixty.	Over sixty.	Total, including undefined.	Population, census of 1885.	Death-rate per 1,000.	Remittent fever, &c.	Typhoid fever.	Small-pox.	Scarlet fever.	Measles.	Whooping-cough.	Croup and diphtheria.	Erysipelas.	Diarrhoeal diseases.	Consumption.	Acute lung diseases.	Brain and nervous diseases of children.	Diseases of heart and circulation.	Urinary diseases.	Adult brain and spinal diseases.	Digestive and intestinal diseases.	Cancer.	Acute rheumatism.	Puerperal.
Atlantic City	489	232	143	463	257	......	......	......	......	31	......	26	2	15	63	18	284	197	101	139	118	78	126	76	33	6	18
Bordentown	148	98	78	313	269	......	......	......	10	19	1	20	2	7	81	5	65	161	62	64	74	35	92	66	22	3	13
Burlington City	290	195	140	444	399	......	......	......	20	31	2	15	2	14	112	10	141	230	124	84	104	69	124	90	32	5	19
Camden City	2,542	1,412	1,031	2,868	1,552	......	......	......	99	385	150	238	24	72	502	19	1,243	1,342	816	769	207	264	619	342	178	20	89
Gloucester City	287	142	120	345	159	......	......	......	8	33	......	22	5	10	57	1	134	189	73	86	45	24	70	41	13	8	15
Bridgeton	374	224	147	433	397	......	......	......	5	54	......	26	4	15	114	10	190	257	163	113	111	48	108	91	29	2	10
Millville	379	287	183	396	280	......	......	......	8	64	......	48	18	14	125	6	224	268	148	92	71	42	75	66	33	4	11
Newark	8,426	5,813	3,296	11,378	5,551	......	......	......	395	800	27	1002	243	254	2574	131	3,810	5,173	3,952	3,124	1841	1294	2240	1419	736	73	344
Orange	720	480	262	988	427	......	......	......	14	66	......	79	22	33	161	17	321	453	394	244	150	122	142	118	61	7	38
Bayonne	713	495	201	677	215	......	......	......	84	50	......	38	17	20	189	12	309	210	308	262	85	69	80	69	25	7	21
Harrison	382	277	188	517	168	......	......	......	52	67	......	38	9	16	113	2	180	225	175	198	45	31	75	45	24	7	20
Hoboken	2,355	1,578	728	2,883	838	......	......	......	58	168	35	174	57	65	683	43	1,259	1,070	890	962	451	288	364	297	161	38	96
Jersey City	8,207	6,073	3,246	10,582	3,918	......	......	......	381	860	254	1218	284	261	2043	106	3,950	4,082	4,003	2,974	1460	932	1526	1380	523	82	340
Town of Union	524	356	200	461	191	......	......	......	28	40	4	61	17	9	226	6	259	202	182	168	91	38	70	61	35	2	23
Chambersburg	392	200	140	393	183	......	......	......	10	31	......	49	20	15	78	5	190	201	131	87	62	34	75	51	34	4	22
Trenton	1,522	842	519	1,910	1,204	......	......	......	51	138	19	171	44	56	326	34	668	983	564	379	307	198	456	292	123	26	68
New Brunswick	837	488	425	1,015	749	......	......	......	28	98	9	78	18	46	269	16	474	515	317	235	200	165	213	158	113	12	25
Perth Amboy	140	75	54	121	49	......	......	......	8	6	......	8	2	2	47	1	67	57	41	46	14	11	25	13	5	3	8
Long Branch	68	30	24	72	46	......	......	......	4	5	......	1	......	3	21	1	47	37	17	15	12	10	25	28	8	1	8
Morristown	226	155	102	451	396	......	......	......	19	20	1	12	1	11	69	4	151	215	111	78	84	59	191	77	40	6	15
Passaic City	473	275	157	416	212	......	......	......	13	50	......	24	13	13	88	8	242	193	162	180	73	51	78	58	17	12	20
Paterson	3,457	2,236	1,233	4,025	2,161	......	......	......	145	269	42	537	110	93	626	51	1,763	1,919	1,432	1,138	655	461	662	575	244	30	152
Salem City	232	115	91	250	274	......	......	......	15	30	3	7	......	10	52	1	105	161	96	43	49	26	84	60	37	7	9
Elizabeth	1,603	1,023	644	1,777	1,076	......	......	......	101	90	4	152	33	72	431	20	737	756	653	585	349	168	398	259	114	14	219
Plainfield	358	193	132	388	361	......	......	......	13	31	1	31	10	9	66	5	209	205	167	99	85	70	111	57	31	8	10
Rahway	236	143	108	404	371	......	......	......	18	25	3	42	6	8	33	10	102	209	159	90	96	38	112	64	31	3	11
Phillipsburg	372	208	148	355	224	......	......	......	8	35	1	46	7	9	94	8	133	157	112	124	60	39	99	71	20	6	18
Totals	35,752	23,645	13,770	44,325	21,927	......	......	......	1545	3486	556	4163	970	1151	9193	548	17,257	19,667	15,355	12,378	6899	4654	8235	5923	2702	391	1682

Cities are generally more unhealthy than their death-rates indicate, since the population is in many of them much decreased for four months in the year, and thousands remove themselves instead of removing the evils which distress and sicken those who remain. Hence, in many of our cities, the death-rate for June, July, August and September, reckoned for the remaining population, is a fair criterion of the health of locality, or at least should be considered for purposes of correction. So, health laws are a great defense to all, but especially to the working classes of cities. It is a question of labor and social science and art, as well as of comfort and hygiene.

SYNOPSIS OF VITAL RETURNS AND COMMENTS ON PRINCIPAL DISEASES.

The following outline presents the comparative number of marriages, births and deaths, as follows:

Average for five years ending June 30th, 1883:

Marriages	8,539
Births	24,281
Deaths	21,981

Number in the year ending June 30th, 1884:

Marriages	8,968
Births	25,263
Deaths	21,716

In the year ending June 30th, 1885, to be reckoned on an increased population of 146,917:

Marriages	8,989
Births	24,077
Deaths	23,807

Year ending June 30th, 1886:

Marriages	12,351
Births	25,497
Deaths	22,734

Year ending June 30th, 1887:

Marriages	15,416
Births	27,340
Deaths	24,331

Year ending June 30th, 1888:

Marriages	16,025
Births	28,074
Deaths	27,173

Average for five years ending June 30th, 1888:

Marriages	9,664
Births	26,050
Deaths	23,952

Average for ten years ending June 30th, 1888:

Marriages	9,101
Births	25,165
Deaths	22,966

Of the marriages since 1885, the following numbers are recognized as of couples out of the State, and are not reckoned in any computation:

1886	2,527
1887	4,332
1888	4,557

For the year 1887–88, we find that of the 27,173 deaths occurring, 6,534 were under one year of age, 3,974 were between one and five years of age, and 2,605 more died between five and twenty years of age. Of those under one year, 1,770 died under one month. In addition, the still-birth return would add 1,739.

In the last report, deductions are made from similar facts, which do not need to be here repeated.

GENERAL REMARKS AS TO THE YEAR.

It is always a matter of serious reflection when the death-rate of any State or portion of the State is not diminishing. With all the allowance that is to be made for increase of population since 1885, it is evident that the number of proportionate deaths is greater. It is not so in the best-situated rural districts. The comparison of localities, of country and city, and of cities with each other, does not fail to show how artificial and local are some of the causes. They are not hard to trace. Among them, overcrowding stands pre-eminent. It is a more prevalent cause of sickness than impure water. Philadelphia, with some marked evils, from the fact that it averages only about five persons to a house has been able to keep its death-rate on an average with many other cities. On the other hand, the large population about New York city have a large tenement population, and often narrow streets and few parks. Valuable contrasts can be drawn between such cities as Jersey City and Plainfield, or Newark and Orange. No one can study these statistics as recorded from year to year, without seeing how artificial is the shortening of human life. A death-rate of 26.82 in Hudson county and of 11.65 in Sussex county means something more than mere location.

It is a favorite hypothesis with the citizens of almost every city that their death-rate is overstated. Always a year or two after a census the growth is overestimated. Lately, we heard it claimed that the reckoning was excessive because undertakers returned to City Clerks deaths that took place outside of city limits. That is true, but the law provides that they shall be returned to the Assessors of townships. Even where they are not, when they come to this office they find record in the locality named in the certificate of death.

It is forgotten, too, that in all our large cities thousands leave for the most unhealthy months, and so all of our reckonings for such cities fall short of the death-dealing capacity thereof. This is shown by the mortality that does prevail among those that remain. In many cases this, reckoned on the basis of the actual resident population at the time, would give a much larger number per thousand.

If an office like this could be subject to any tendency or prejudice it would be to minimize the death-rate, and so show the rapid value of sanitary measures. While we have a system of return that every year is demonstrating its excellence, yet it is inevitable that some cases will escape return. After a full consideration of the facts and figures, and of all disturbing incidents, we find but two places in the State in which the death-rate is above the actual evidence as to locality. These are Atlantic City, where the floating population is so comparatively large and where invalids resort, and North Bergen township, Hudson county, in which all the county institutions are located. So far as possible, institutional returns are noted. By the last Registrar-General's report for England and Wales (1887), we find the mortality to have been only 18.8 per 1,000, and that for London but 18.5. Although this was the lowest on record since 1837, the death-rate of 19.2 per 1,000 of the estimated population for 1888 in the twenty-eight larger English cities seems to indicate a lower record for the whole country. That of London for 1888 is 18.6.

We thus see what a vast opportunity we have for improvement. It is well recognized that England owes this result largely to its more thorough, extended and exacting sanitary methods. The government has come to know that it pays to diminish the sickness and preserve the lives of its people by large expenditures for great sanitary improvements. This State has made some marvelous advances for the past ten years, but they should be four-folded before the twentieth century dawns. The work is chiefly that of Local Health Boards and other local authorities. Located as the State is and increasing in population as it is, we are sure to have increasing death-rates, unless we put ourselves upon the preventive basis and on a far more liberal and radical scale.

Inspectors must be better educated, better paid and held to more strict account of their work. They must be greatly increased in numbers. Some of our Boards in small towns have shown what a faithful Inspector can do in limiting disease and in securing better sanitary conditions.

PRINCIPAL DISEASES.

REMITTENT FEVER.

The total of deaths from this cause for the official year is 264. The average for the past ten years has been, per year, 289. An examination of each yearly record shows some diminution with the exception of those years in which some special climatic influences seem to be in operation. There can be no doubt as to the relation of moisture and of wet and undrained lands, and abundance of vegetable matter, to the whole class of malarial fevers. Much depends upon the circumstances under which this vegetable matter is undergoing decomposition—upon its amount and the degree to which it is being appropriated by growing vegetation. There is a law of natural change quite in accord with health. On the other hand, there are forced, unnatural and profuse decompositions which outreach the adjusting and compensating and appropriating powers of nature, and so produce the materials for human disease. The evidence that the malarial microphyte or micro-organism of Loveron is related to its causation seems to be confirmed by the more recent investigations of Osler, Carter and Councilman. Whatever may be this relation, it in no wise diminishes the importance of removing the great fertilizing localities of these low forms of vegetable life. Results such as have been secured by the removal of mill-dams at Rahway and Bound Brook, by drainage in and about

Burlington, and by the drainage of the Pequest valley, in Warren county, give promise of greater gains when such improvements are fully followed up and new accumulations not permitted. It is cheering to know that the efforts of the Geological Survey, the Board of Agriculture and of this Board, as to the drainage of the upper Passaic, have resulted in securing the co-operation of the owners of the mills at Little Falls, and that already the "Great Piece" of drowned lands beyond Caldwell is being drained under the direction of Messrs. Harrison, Blauvelt and Howell as Commissioners.

Hudson and Essex counties suffer most from malarial diseases, and there is much need of great attention to this matter in various localities.

TYPHOID FEVER.

The total of deaths reported therefrom for the statistical year was 620. The average for the last decennial period has been 579 per year.

Its specific character is well known, as well as some of the laws of its production. Professor Brouardel, of the Faculty of Medicine of Paris, in a paper in the September 26th and October 2d, 1887, numbers of the *Revue d'Hygiene*, speaks thus: "I wish to demonstrate that the agents for the propagation of this disease are the water we drink, the air which we breathe, soiled clothing and the hands of the nurses. * * * To-day it is possible to assign to each of these means the share which belongs to it." He then gives the evidence as to water being the great conveyancer.

As to air, beginning with Murchison's case (1828), he quotes various cases and authorities since to date to show its conveyance by the air, but that in each instance the air was saturated with moisture.

He shows that distribution by the hands or contact with clothing is rare, and concludes, as a whole, that water is the distributer in 99 cases out of 100. Prof. Roch, in a recent address before the College of Military Medicine, considering the relation of soil, air and water to the development and diffusion of micro-organisms, says that moisture is essential for their multiplication and development. "So, air contains much fewer microbes than water, and is thus a less favorable medium for the spread of infective material than fluids, especially as air distributes mostly only those microbes that can exist in the dry state."

This, next to small-pox, ought to be the most preventable disease.

Nothing less than indignation should be expressed against polluted water-supplies. They are a constant menace to public and personal health. They are to be guarded as we would guard the citadel of life, for too often they are the general distributors of disease, and only await some specific poison in order to become the draught of death.

Typhoid fever is especially a disease of large cities, or of counties in which the population is dense. Hudson county reported the last year 179 deaths from this cause, and Essex county 92. The number for Hudson county is especially large. In Jersey City alone there were 114 deaths therefrom, while Paterson, with more than one-third of its population, had but 21. While the number of cases in a single year may be excessive from some temporary cause, yet a large decennial average is the certain evidence of failure in proper provisions for sanitary administration and police.

But typhoid fever is not only a disease of cities. Sad cases occur like that near Franklin Park, in Middlesex county, where a case originating in another place, by reason of some oversight, proves the center of infection for a family or a neighborhood—generally by reason of the pollution of the well-water.

In Burlington county we have facts that show that the disease occurs too frequently in country villages and separated farm-houses. Thus, at Medford, Smithville and some other points there have been cases one after another in succession, and sometimes mild endemics. Dr. Hollingshead, of Pemberton, who practices over quite a large section, says it is no year absent, varying in numbers and severity. Dr. Stokes, of Moorestown, reported thirteen cases. Drs. Page and Van Mater, of Columbus, had twenty cases. Dr. Gauntt, of Burlington, claims that both it, diarrhœa and dysenteries are too frequent in the county, and attributes it to the habit of having the well in an adjoining shed, around which much washing of pans, &c., is done, and where slops are often thrown. My own study of the statistics and my conversation with physicians of that county, lead me to believe that there are even more cases of this disease than are represented by the death-rate. We beg to insist that typhoid fever should be more closely studied with a view to its prevention by purity of water-supply, isolation, disinfection, &c.

SMALL-POX.

The deaths from small-pox have only been five. The average of deaths therefrom for ten years has been seventy-one. We owe this exemption to vaccination, to the greater care of school boards and to the prompt action of local health authorities as to isolation and other aids.

If only some other diseases more common and fatal, equally alarmed the people, and if only the same methods of isolation and disinfection were promptly used, we should have some similar results. Every year emphasizes the need of vaccination. Recent facts seem more fully to impress the need of revaccination after twelve years of age. (See article on Vaccination; in Secretary's Report herewith.)

The unfortunate essay of Dr. Creighton, furnished to the Encyclopædia Britannica, has been so fully criticised as to show that it is not sustained by facts. Although recognizing the great value of vaccination, it magnifies certain limitations beyond their true value. While it is true that we do not have compulsory vaccination, our law does claim that all children who have never had the small-pox or been vaccinated, may be excluded from attendance at public schools whenever cases occur in the city or district.

SCARLET FEVER.

The mortality from scarlet fever for the statistical year was 574. That for the ten years gives an annual average of 610. It threatened an epidemic at Englewood, but the Board of Health applied to it the methods of isolation and disinfection used in small-pox, and much limited the spread. Hudson county reports 140 deaths therefrom, and Essex county 44. The special excess was in Passaic county, which recorded 181 deaths, of which 172 were in Paterson. No new facts have been developed as to its contagion. The claim of Messrs. Powers and Kline that it is a disease occurring primarily in cows and so conveyed to mankind, has been so controverted by Profs. Crookshanks and Brown that it meets with less acceptance.

More attention than formerly is now given to all throat conditions. The doctrine of the microphytic origin of disease indicates to us that most of the contagions are received by breathing, and first come in contact with the throat. Some of them are certainly local before they are constitutional. In our tenth report (1886), pages 37–40, we gave some important facts as to the lymphatic tissue of the tonsils, fauces, &c., and the ready susceptibility of this region.

"Since Stöhr has shown that the epithelium of normal tonsils presents openings, stigmata or holes through which white blood corpuscles pass constantly into the mouth, the way is open directly to the blood for the passage of outside germs." So, whether at first local or constitutional, this is the great port of entry for the "*contagium vivum.*" It is for this reason that we have long urged the greatest care of the mouth. Let not a bad breath be the invitation to or the soil for the particles of disease. Keep the mouth shut in presence of concentrated contagion. Let the throat be protected on its surface from this readiness for absorption. We believe that this explains why condiments, iron, quinine, potassium chloride, &c., by frequent use in small quantities, seem to be aids in withstanding contagion, as well as, perhaps, the presence of these antiseptics in the blood. The cleansing of teeth and the rinsing of the mouth are important as aiding in protection against contagion. The following points to which Dr. Wetherill, of Trenton, draws attention, in connection with interesting clinical details of some cases in his practice, are worthy of note.

"1. Scarlatina often deviates from the true type, as we know it, and may be so masked as to resemble another disease so closely as to make the differential diagnosis very difficult, or even impossible, in its early stages, and sometimes in any stage. 2. The danger of contagion from these cases is increased greatly, and the fever contracted in this way may be of a severe and fatal kind, so that, 3, this is a disease we should exercise unusual care in detecting and quarantining. 4. The disease may be inoculated when the virus has access to the blood, and more than ordinary care in cleansing instruments such as the tongue-depresser and thermometer is required, and there should be thorough disinfection before their use in any surgical operation. The same disinfection is necessary also before obstetrical cases are attended. 5. Careful and frequent examination of the urine for albumen, epithelium and casts is a valuable diagnostic measure, and may forewarn the attendant of approaching danger of uræmia, and may save a sudden fatal termination of the case when it is supposed the patient is convalescent."

MEASLES.

Deaths from this disease were comparatively few the past year and quite in contrast with the excessive record of the former year. Seventy-four fatal cases are reported.

The average for the last ten years was 135 per year. As the great danger is from bronchial and pneumonic complications, much depends on the care exercised during the sickness and convalescence. The influence of climate and weather upon the disease is very marked. It is a very persistent and spreading contagion—perhaps the most so of all the communicable diseases, save small-pox. It is a good disease for the study of the bacteriologist, although no microphyte is yet authenticated.

WHOOPING-COUGH.

The year's death-record for this is 161. The ten years' average is 187. Elizabeth reports fourteen cases, an unusual mortality. The one point as to its spread which needs to be emphasized, is that the dried sputa convey the disease except in the presence of abundance of good air. The spasmodic cough often gives rise to other nervous affections. Parents are too apt to make light of severe cases, because often the child seems comfortable in the intervals of paroxysm.

DIPHTHERIA.

This continues to be the most formidable and fatal of the ordinary communicable diseases.

Two thousand and thirty-six deaths are reported from this cause. The average for the ten years has been 1,280.

Hudson county reports 473 deaths, of which 285 were in Jersey City. Essex county reports 456 deaths, of which Newark had 397. Orange, at the same rate, would have had 170 instead of 17.

It was persistent and fatal at Lyons Farms, Essex county, and Millville, Cumberland county.

At Elmer, in the same county, out of twenty-eight cases there were fourteen deaths.

It was prevalent in various localities throughout the State.

Diphtheria was first separately returned in the English Registrar-

General's reports in 1855. It was first separately returned for London in 1859. It first seemed to be a disease more marked in the rural than in the urban districts. Yet the statistics since 1855 show that there are two special diphtheritic areas in England and Wales—the southeastern area, consisting of London and of eleven surrounding registration counties, and the western or Welsh area, consisting chiefly of North Wales and Shropshire. During the last seven years—1881–7—the rate of mortality from diphtheria in London has exceeded the mean rate in the whole of England and Wales; for these years the mean annual rate was 217 per million. Thus, as here, the claim of its being a rural disease has been modified, and yet its spread seems quite as marked in small villages as in larger cities.

The views presented by the Secretary in a special circular addressed to the physicians of the State, 1887, as to the need of more care on the part of physicians as to the details of isolation and disinfection, are fully sustained by increasing numbers of facts. It cannot be concealed that, as elsewhere, there is a great difference as to sanitary practices. One physician treats his case, but seems not to be as skilled and exact in dealing with all disturbing influences. The other turns his attention also to the details of sanitary care of premises and surroundings, and either sees that they are properly attended to or sends for the Sanitary Inspector. For two successive years the Board of Health of Michigan has traced results. As to the results in 1886, Dr. I. Lewis Smith, of New York, comments thus: Dr. H. B. Baker, Secretary of the State Board of Health, Michigan, has published statistics showing that in 102 attacks of diphtheria, the average number of cases where disinfection and isolation (either one or both) were neglected was 16, and the average of deaths 3.23; while in 116 outbreaks in which isolation and disinfection were enforced, the average number of cases per outbreak was 2.86, and of deaths 0.66. These precautionary measures, therefore, prevented 13 cases and 2.57 deaths for each outbreak, or, in the total, 1,545 cases and 298 deaths in the year.

In the abstract of proceedings of the Board, October, 1888, Dr. Baker thus states the results for 1887:

RESULTS OF WORK TO PREVENT DIPHTHERIA IN 1887.

"In those outbreaks of diphtheria in Michigan in 1887, where the recommendations of the State Board of Health as to isolation and disinfection were fully carried out, there were only about one-fourth as many cases and deaths as in those outbreaks where these measures were not taken. Compared with those outbreaks in which either isolation or disinfection or both were neglected, there was, in the 78 outbreaks in which isolation and disinfection were both enforced, a saving of 160 lives and 721 cases of diphtheria. Although this is a record of a saving of human life of which those officers who contributed to it should be proud, yet the saving of life in Michigan during the year 1887 from this disease was undoubtedly much greater than is shown by such a comparison, because, if in each of the 398 outbreaks reported there had been as many cases and deaths as there were in each of the 118 outbreaks in which either isolation or disinfection or both were neglected, there would have been 1,079 deaths and 4,692 cases. So that, without counting the saving which probably occurred in outbreaks in which only one of the essentials (isolation and disinfection) was neglected, there is indicated a saving in Michigan in 1887, from this one disease, diphtheria, of 518 lives and 2,371 cases of sickness.

"The evidence of the experience in 1887 is all the stronger because it is in harmony with the facts previously reported, relative to the year 1886. It is to be regretted that in 202 outbreaks the health officers' reports were not sufficiently definite to make it certain just what was done; but there is cause for congratulation that the local work by those health officers who made these imperfect reports was apparently better than their reports, because if in each of these 202 outbreaks there had been as many cases and deaths as in each of the 118 outbreaks in which isolation or disinfection or both were known to have been neglected, there would have been 357 more deaths and 1,650 more cases than was reported to have occurred. The table, exhibiting the facts, is as follows:

DIPHTHERIA IN MICHIGAN IN 1887.

Table exhibiting the average number of cases and deaths reported per outbreak—in all the 398 outbreaks reported; in the 202 outbreaks in which it is doubtful whether or not disinfection or isolation was secured; in the 118 outbreaks in which isolation or disinfection or both were neglected; and in the 78 outbreaks in which isolation and disinfection were both enforced. Compiled in the office of the Secretary of the State Board of Health, from reports made by local health officers.

	(398 outbreaks)		Isolation or disinfection not mentioned or statements doubtful. (202 outbreaks.)		Isolation or disinfection, or both, neglected. (118 outbreaks.)		Isolation and disinfection both enforced (78 outbreaks.)	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Totals	2,321	561	732	190	1,391	320	198	51
Averages	5.83	1.41	3.62	.94	11.79	2.71	2.54	.65

Prof. Oertel, of Munich, well known for his former studies of diphtheria, has made, the past year, a very important contribution to its histiology, and one bearing on its treatment. It seems to prove it to be in its start a local disease, and so we have emphasized the value of very early local and systemic treatment. But it is also shown how soon local treatment becomes secondary. The following editorial of the London *Lancet* is commended to the notice of physicians:

"The recent elaborate inquiry of Professor Oertel, of Munich, of which we have given an account in these columns, seems to have advanced our ideas upon the nature of the disease one step, although it leaves its etiology still in obscurity. It is true, doubtless, that the conclusions at which Professor Oertel has arrived are much the same as those which are now generally held; but his great merit lies in this—namely, that he has given such conclusions that basis of fact which was heretofore lacking. We have, therefore, now a clearer insight into the nature of the morbid process, and can with greater confidence deal practically with the disease. The main outcome of Professor Oertel's work is as follows: Diphtheria is a disease which is excited by a specific contagium. This contagium—by analogy rather than from absolute demonstration—is of bacterial nature. The implantation of the contagium upon a mucous membrane, usually that of the fauces, leads to changes commencing in the surface epithelium. It is inferred that the virus, probably a ptomaine, at once acts upon the mucous membrane, exciting inflammation, as shown by the leucocytal infiltration that occurs. The leucocytes themselves become attacked by the virus, and undergo remarkable changes which lead to their disintegration. These changes, which have been so exhaustively studied by Professor Oertel, are marked by abnormal cleavage and chemical alteration of the cell-nuclei; they eventuate rapidly in the formation of areas of necrobiosis in the substance of the mucous membrane. The diphtheritic false membrane is therefore but part of a process that involves the whole mucosa. The lymphadenitis in connection with the altered mucous tract is strictly specific, for the glands show the same changes as to necrobiosis as the membrane itself. Similar lesions, but less intense and numerous, occur in the intestine and the mesenteric glands, and also in the spleen; but in other viscera the lesions are referable to inflammatory reaction rather than to the essential phenomena of the disease. The study is a demonstration that diphtheria is at the outset a strictly local disease, but that in a few hours its poison spreads in the part first affected and in its vicinity; and in a few days it may enter the blood in such amount as to produce the most marked evidence of systemic poisoning, which, if not causing death from its effect on the heart or other vital organs, may in due course produce peripheral neuritis, and perhaps myelitis.

"Diphtheria, then, is not in the first instance a systemic poison; it is local. Just as in syphilis the attempt has been made to prevent the constitutional malady by excision of the local contagious sore, or in hydrophobia by excision of the bite-wound, so in diphtheria it might be thought that the disease could be arrested by dealing with the local manifestation thoroughly. This conception has been largely put into practice from the earliest days of the history of diphtheria, and the false membrane has been ruthlessly destroyed only to re-form. This period of the violent escharotic or other means of removal of the false membrane must be closed. Milder solvents are applicable; but, if Professor Oertel be correct, the object they aim at is unattainable. The membrane may be dissolved and detached, but the disease is not cured; for the membrane is only the surface indication of a deep-seated and widespread change. Nevertheless, it is well to minimize the risk of the extension of the disease by contagion within the body by the free disinfection of the pharynx. As for other treatment—for we have no antidote for the diphtheritic poison—reliance must be placed upon nutrition being maintained."

ERYSIPELAS.

Erysipelas records 128 deaths, the yearly average for the ten years being 101.

There is a growing recognition of the specificity and of the communicability of this disease. Not only is much to be done by active medication at the start, but all sanitary conditions are to be attended to. The relation of the malignancy of some epidemics to filth conditions is fully recognized.

The gravity of the disease is all the more serious because of the special susceptibility of women after labor and the sad losses of mothers that it thus too often causes. The subtle poison may be carried by doctors or nurses unless the most scrupulous asepticism is exercised.

DIARRHŒAL DISEASES.

Three thousand five hundred and eight is the record of deaths from this cause the past year of those under ten years of age. The decennial average has been 592. It is worth while for every city to study closely the proportion of these deaths to the number of children living under this age, the localities, by wards or sections, where they occur, and the deviations from ordinary diarrhœa which show themselves in cholera, cholera infantum, or some other form resembling epidemicity. It is always to be remembered that the number of deaths from this disease and from the communicable diseases is far more indicative as to local conditions than a general death-rate. Also, that the mortality is not near as great as most cities are capable of causing, because of the migration of so large a number of citizens with their families during the heated term. It is difficult to select out in all cases the operating cause, but a close study of statistics of various years and large populations points to overcrowding, foul air, impure water and unfit foods as the operating causes.

CONSUMPTION.

The record of the past year is 3,358, 1,723 being males and 1,635 females. The total average for the ten years is 3,182.

Besides the specific character of the disease, it is to be remembered that lung diseases represent a great variety of causes. Sudden variations of climate, exposures in trades and various industries, measles, overcrowding, in fact almost any condition or disease which is depressing and debilitating tends to make impression upon the respiratory centers and tissue and to interfere with that process which, beyond all others, is indispensable. The influence of climates and occupations is now being studied as never before, with the hope that something may be done to diminish the inroads of so destructive a disease.

ACUTE LUNG DISEASES.

Our record for the year is 2,922, and for the ten years a yearly average of deaths of 2,438.

Pneumonia especially seems to be on the increase. It is at times so prevalent that in the forms of typhoid pneumonia it is claimed to be endemic. Yet there are no pathological conditions to distinguish it. Strong claim is made of its being due to or accompanied by the presence of a specific microphyte or micro-organism. It frequently results from unwise change of clothing, as when persons dress for an evening entertainment, or from imprudent exposure or improper management just after them. The influence of the foul air of assembly-rooms and the sudden change on coming out, or of confined foul air from any cause, is not to be overlooked. The writer is strongly under the impression of suffering from an attack brought on by such exposure in the vaults of the Camden jail. The whole question of factory labor also needs to be studied in the relation of various dusts and of errors in heating and ventilation to these various lung diseases. While bronchitis is the more common manifestation, pneumonia or consumption often results.

BRAIN AND NERVOUS DISEASES OF CHILDREN.

Of deaths from this class of diseases, 1,971 are reported for the statistical year.

The yearly average for ten years was 1,762. There are many varieties in these diseases, but among children they too often stand for some form of hereditary impairment, or for exposure to influences that tend to enfeeble the nervous system. There is a much larger proportion of these diseases in cities. School life is recognized as producing or developing much disease of the nervous system. Often imperfect nourishment, foul air, and overpressure in studies so breaks down the nervous system at an early age as either to destroy life or to produce permanent limitation of vital force. Even the number of deaths fails to express the amount of damage done. Children need to be recognized as animals far more than they are, and, at least, to be given all the chances for vigor that a stock-raiser would give to his registered stock. How different is this from the reality! We desire especially to call attention to the need there is in our American civilization of giving the most thorough attention to the hygienic care of childhood.

DISEASES OF THE HEART AND CIRCULATION.

The record of deaths for the year is 1,691. The yearly average for ten years is 1,313.

It is believed that by reason of improvements in the treatment of acute rheumatism, heart disease from this cause is not so common as formerly. But this diminution has been more than made up by the excitement of this age, by stress and strain of modern occupations and sometimes of modern exercises. Alcohol and tobacco are still making great inroads upon the circulation. The use of the word "heart-failure" as a cause of death has become very common, but has no more real meaning than to say a person died for want of breath. It is a mode of death, and not a cause of death.

RENAL AND URINARY DISEASES.

Disorders of the great cleansing or emunctory system are always fraught with danger to health and life. Deaths from these causes the past year number 1,020. The average for ten years being 753.

It is sometimes forgotten that more solid matter in the form of urea, &c., is removed by the kidneys each day than by any other one system. Sudden exposure to severe alternation of temperature, the excessive use of alcohol, cayenne pepper and other condiments disturb and irritate the minute circulatory system of the kidneys, and we have as a result various forms of inflammation and consolidation, interfering with normal action. As the retention or too slow elimination of urea from the blood is the retention of a poison, it is no wonder that many of the cases of heart disease and brain disease have their start in the imperfect action of the renal system. In our office tables we distinguish between renal and urinary diseases as far as possible, although the certificates do not always make these plain.

ADULT BRAIN AND SPINAL DISEASES.

The returns for the year show 2,095 deaths therefrom, the yearly decennial average being 1,405 deaths. Besides some increase, perhaps the most noticeable feature is the comparatively early adult age at which so many deaths from apoplexy, paralysis, &c., occur. Now that we have come to know that so many asylum cases are due not to original disease of the brain or hereditary taint, but to some form of systemic derangement, worry or overwork, we should remember that the 2,600 in our asylums stand for very many more who are approaching similar conditions or have averted them by a very narrow margin. There is no specific for such diseases, and so we need most to turn to preventive measures. Regular life in accord with the laws of health can alone diminish the death-record from these causes.

ADULT DIGESTIVE AND INTESTINAL DISEASES.

The deaths from these causes for the year are recorded at 1,476.

For the ten years the average has been 1,093. These stand as representatives of all forms of digestive impairment or incapacity, and so it is difficult to make accurate inferences therefrom. When, however, we come to deal with large populations through successive years and to contrast city and country, and to consider the alleged causes, we find that some light is thrown on the question of foods and drinks, and especially recognize that an over-indulgence, either in foods or stimulants, and in some cases too restricted diets, are alike unfavorable to longevity. With the various peptones and dietetic preparations, and with a more accurate knowledge of the functions exercised by various organs and parts of the intestinal tract, we are better able to suit treatment to the control of this class of diseases.

CANCER.

The death-record for the year is 612 and the yearly average for ten years 482.

The apparent increase of cancer has attracted the attention of the English and continental physicians, as well as those of our own country. Will it yet become a neoplasm like tubercle, and so add to the list of constitutional and critical diseases?

There is more reason to assume that the diagnosis is not always accurate, and that other forms of tumor are classified with it. It is certain that it should receive prompt attention, for the disease sometimes seems local before it is constitutional.

ACUTE RHEUMATISM.

The record of deaths from this cause the past year is 142. The decennial average being seventy-five.

No disease is more obscure as to its causes. While often excited by sudden cold, it is regarded by many as specific in its character. It is not to be confounded with various forms of myalgia and neuralgia, which, although allied in some of their symptoms, have none of its fevers or inflammations.

PUERPERAL DISEASES.

Two hundred and seventy-one deaths occurred from these, while the yearly average of the decennial record is 245.

This always stands for losses especially afflictive because of the removal of mothers who leave children that especially need their care and love. Some losses occur by reason of neglect in early attendance or by the incompetency of the person in charge. Subsequent fever also destroys many. There is less uniformity in these puerperal fevers than was formerly supposed, so that authors and practitioners are inclined to regard them as representing more than one contagium. But there can be no doubt that what is known as puerperal fever is often the result of indirect communication with some previous case. Hence, there is the greatest need of recognition of this on the part of attendants, and always of the most scrupulous care in exacting cleanliness and in all the details of the antiseptic art.

ACCIDENTS.

The number of deaths due to this cause is 1,320.

We do not always publish records of accidents, since these are so varied that they need to be studied in classes rather than in bulk. But any one familiar with returns is struck by the great preponderance of railroad accidents. Boiler explosions, imperfect machinery or undue care as to the protection from revolving wheels, belts, &c., cause many losses. When it is remembered that an accident is usually preventable, and that thus many of our most valuable artisans are lost, too much attention cannot be given to the protection of life and limb.

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